

1 STATE OF MINNESOTA DISTRICT COURT
2 COUNTY OF RAMSEY SECOND JUDICIAL DISTRICT
3 - - - - -
4 The State of Minnesota,
5 by Hubert H. Humphrey, III,
6 its attorney general,
7 and
8 Blue Cross and Blue Shield
9 of Minnesota,
10 Plaintiffs,
11 vs. File No. C1-94-8565
12 Philip Morris Incorporated, R.J.
13 Reynolds Tobacco Company, Brown
14 & Williamson Tobacco Corporation,
15 B.A.T. Industries P.L.C., Lorillard
16 Tobacco Company, The American
17 Tobacco Company, Liggett Group, Inc.,
18 The Council for Tobacco Research-U.S.A.,
19 Inc., and The Tobacco Institute, Inc.,
20 Defendants.
21 - - - - -
22 TRANSCRIPT OF PROCEEDINGS
23 VOLUME 53, PAGES 10464 - 10711
24 APRIL 2, 1998
25

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

1 P R O C E E D I N G S.
2 THE CLERK: All rise. Ramsey County
3 District Court is again in session, the Honorable
4 Kenneth J. Fitzpatrick now presiding.
5 (Jury enters the courtroom.)
6 THE CLERK: Please be seated.
7 THE COURT: Good morning.
8 (Collective "Good morning.")
9 THE COURT: Counsel.
10 MR. CIRESI: Thank you.
11 Good morning, ladies and gentlemen.
12 (Collective "Good morning.")
13 DAVID E. TOWNSEND
14 called as a witness, being previously
15 sworn, was examined and testified as
16 follows:
17 CROSS-EXAMINATION (cont'd)
18 BY MR. CIRESI:
19 Q. Good morning, doctor.
20 A. Good morning.
21 Q. Can you direct your attention, please, to
22 Exhibit 10485, which is in volume one. You will
23 recall when we recessed last night we were talking
24 about Dr. Gori.
25 A. Okay, I'm there.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

1 Q. That's a trip report on a visit to the United
2 States, it comes from the BATCo files, and produced
3 here in the Minnesota tobacco litigation.

4 MR. CIRESI: Your Honor, we would offer
5 Exhibit 10485.
6 MR. WEBER: Your Honor, we'd object on
7 foundation and on the fact that there's hearsay
8 within hearsay throughout the document.
9 MR. CIRESI: Your Honor, we'd submit its
10 admissible under 801(d)(2), subparagraphs C., D. and
11 E., and also under 803(6) and (16).
12 THE COURT: The court will receive 10485.
13 BY MR. CIRESI:
14 Q. Sir, this is a report on a visit to the United
15 States dated May 1973. Do you see that?
16 A. That --
17 Yes, I see that. And that's what it appears to
18 be.
19 Q. And did you get an opportunity to review this
20 document as one of the ones designated?
21 A. I've seen this document as one that you
22 designated for my cross-examination. I haven't read
23 it thoroughly, I've just briefly scanned it, just a
24 portion of it.
25 Q. Prior to the time that you looked at it pursuant
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND
10467
1 to the designation, had you ever seen the document?
2 A. No, sir.
3 Q. Now in 1973, was the cigarette sales of the
4 companies increasing in the United States?
5 A. I think the overall sales of the -- of the
6 cigarette market in the United States was increasing
7 prior to 1973.
8 Q. Okay. And if you'd direct your attention to
9 page two, and I'm using the Bates -- page numbers at
10 the bottom, not the Bates numbers, doctor. Do you
11 see it there?
12 A. The first page of this document is 6995?
13 Q. Yes. I'm not using the Bates numbers. If you
14 turn to the next page, --
15 A. Oh, okay.
16 Q. -- it's page two. Do you have it?
17 A. Yes.
18 Q. And paragraph number four?
19 A. Yes.
20 Q. You see it's reported there that cigarette sales
21 were increasing at the rate of two to three percent
22 per annum; correct?
23 A. That's what it says.
24 Q. And about double that rate in dollar value;
25 correct?
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND
10468
1 A. And it says "and up to about double that rate in
2 dollar value."
3 Q. And at this time Philip Morris had started to
4 manufacture in their new Richmond factory, which is
5 described as a mammoth new factory?
6 A. It says "Philip Morris have had to start
7 manufacturing their mammoth new Richmond factory...."
8 Q. And that factory with its 200 Molins Mark IX

9 machines would eventually be capable of making about
10 25 percent of the cigarettes smoked in the United
11 States; correct?
12 A. That's what it says.
13 Q. And demand for cigarettes was increasing among
14 the young, especially women, and among the blacks;
15 correct?
16 A. That's what it says.
17 Q. And that's --
18 Does that square with any historical review that
19 you've done?
20 A. I haven't done a historical review on
21 demographics of smoking.
22 Q. Now in 1973, do you know if there was a Surgeon
23 General in office at that time?
24 A. In 1973?
25 Q. Yes.

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953

CROSS-EXAMINATION - DAVID E. TOWNSEND

10469

1 A. Ah, well, I don't know the details, but I would
2 assume so.
3 Q. All right. Can you turn to page three, number
4 six, paragraph number six. And that's entitled
5 "People and Organizations Currently Concerned with
6 Smoking and Health." Do you see that?
7 A. Yes.
8 Q. And it states that "The Surgeon General, whose
9 advice is quoted on every cigarette packet, no longer
10 exists. Since the resignation of Steinfeld, the post
11 has been left vacant. The post was set up by
12 statute, so that it cannot be abolished, but the
13 evidence is that no new appointment will of made.
14 (There is apparently still a Deputy Surgeon General,
15 but no one has heard of him). Consequently, there is
16 no high level government leader of the anti-smoking
17 movement." Do you see that?
18 A. Yes, I see that.
19 Q. Does that square with your recollection as to
20 what the status of the Surgeon General's post was in
21 1973?
22 A. I really don't have detailed knowledge of what
23 the Surgeon General's post was in 1973.
24 Q. Can you turn on to the next page, and do you see
25 there that there's a reference to "The smoking and

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953

CROSS-EXAMINATION - DAVID E. TOWNSEND

10470

1 health issue has to some extent become merged with
2 the conquer cancer movement initiated in 1971 by
3 President Nixon?"
4 A. That's what it says here.
5 Q. And it's reported that "It is now accepted,
6 however, that the move was intended by Nixon as an
7 election gimmick rather than as a serious
8 crusade...?"
9 A. That's what it says here.
10 Q. And that Nixon, once safely elected, was thought
11 to have lost interest in the issue?
12 A. That's what it says here.
13 Q. And if you go on to paragraph eight, it talks

14 about the nominal top body in the cancer research
15 world?
16 A. I'm sorry, where are you?
17 Q. In paragraph eight, sir.
18 A. Yes. It says, "The nominal top body in the
19 cancer research world...."
20 Q. Yes. "...is now the three-man committee, known
21 as 'the troika', that reports directly to the
22 President."
23 A. Yes.
24 Q. And then it goes on to state, "This consisted of
25 Benno Schmidt (an industrialist), Dr. Clark
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10471

1 (President, M.D. Anderson Cancer Hospital, Houston,
2 Texas) and Dr. Robert Good (Director of
3 Sloan-Kettering Institute for Cancer Research) who
4 has since resigned;" correct?
5 A. That's what it says.
6 Q. And it reports that this -- that the author was
7 told that "this Committee was really a political
8 buffer, whose main job and practice was to see that
9 Presidential views about appointments and
10 distribution of contracts to loyal Republican
11 supporters were given effect. This may largely
12 explain why Dr. Good, who is from Sloan-Kettering,
13 resigned so soon after being appointed." Do you see
14 that?
15 MR. WEBER: Objection, Your Honor. We're
16 getting far beyond the scope of the direct here,
17 historical --
18 THE COURT: Are you heading for something,
19 counsel?
20 MR. CIRESI: I am, Your Honor.
21 THE COURT: All right.
22 Q. Do you see that, sir?
23 A. I see that. I don't know whether that's true or
24 not, but I see that written here.
25 Q. Do you know if in 1973 there was a turmoil, if
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10472

1 you -- if I may use that term, in the research area
2 as to who would head it and what form it would take
3 concerning smoking and health?
4 A. I don't know.
5 Q. Can you direct your attention, then, to
6 paragraph 14. And do you see that this refers to the
7 Tobacco Working Group and Dr. Gori? Do you see that?
8 A. Yes.
9 Q. And it's reported here that "At present, the
10 Tobacco Working Group remains the body primarily
11 concerned with smoking and health. The status of the
12 TWG in the NCI and HEW hierarchy is influenced
13 largely by the status of its Chairman. The previous
14 chairman, Dr. Carl Baker, was Director of the NCI.
15 Gori, as mentioned above, is only Associate
16 Scientific Director for Program of Division of Cancer
17 Cause and Prevention, National Cancer Institute. He
18 has, however, been seeking a higher appointment

19 within the NCI, particularly as Associate Director,
20 Division of Cancer Cause and Prevention, since the
21 post is vacant at present. In this he has been
22 supported by Philip Morris, but when Philip Morris
23 pressed Gori's claims at the White House, they were
24 asked: 'Who is Gori?'" Do you see that?
25 A. I see that. I don't know whether that's true or
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10473

1 not.
2 Q. Do you recall yesterday the document that we
3 looked at immediately before recess dealt with the
4 industry representatives, Dr. Hughes and Dr. Spears,
5 who met with Dr. Gori?
6 A. I remember the document that we read through.
7 Q. And at the end of that, Dr. Gori, as an aside,
8 had asked whether or not the industry couldn't
9 support Dr. Gori because he was friendly to them, do
10 you remember that?
11 A. I remember in a general sense something along
12 the lines that you're describing. I can't remember
13 it verbatim. And again, I don't know the
14 circumstances behind it.
15 Q. And can you direct your attention to page 16 --
16 I'm sorry, page eight, paragraph 16. Excuse me,
17 doctor, it's the next page. And if you go to the
18 bottom of that, do you see that it's referenced that
19 the strongest anti-smoking force in the U.S. at the
20 present time was the American Cancer Society?
21 A. That's what it says.
22 Q. And that "The Cancer Society is becoming
23 increasingly hostile to the Tobacco Working Group.
24 It has never had any representative on the TWG and
25 Hammond recently accused Gori of having sold out to
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10474

1 the tobacco interests." Do you see that?
2 A. That's what it says.
3 Q. Do you know who Dr. Hammond is?
4 A. Yes. He's with the American Cancer Society.
5 Q. And has he done a lot of work in the
6 smoking-and-health area, sir?
7 A. He's done quite a bit of work in smoking and
8 health.
9 Q. Can you direct your attention now to Exhibit
10 24274, which would be in the next volume, sir.
11 A. Okay. I'm sorry, the document is?
12 Q. 24274. And it's toward -- toward the end,
13 doctor. You'll find it right toward the end.
14 A. Okay.
15 Q. It's a B.A.T. Company document dated October
16 20th, 1978.
17 MR. CIRESI: Your Honor, we'd offer Exhibit
18 24274.
19 MR. WEBER: No objection, Your Honor.
20 THE COURT: Court will receive 24274.
21 BY MR. CIRESI:
22 Q. Now this relates to some papers by Gori on safer
23 cigarettes; is that right?

24 A. It does reference Gori and -- and at least some
25 of his papers.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10475

1 Q. And it says, "A lot of press attention in the
2 U.S.A., but surprisingly virtually none in England,
3 was given recently to statements by Gio Gori of the
4 National Cancer Institute that it was possible to
5 smoke quite large numbers of certain named brands
6 without substantially increasing one's risk of
7 mortality." Do you see that?

8 A. That's what it says.

9 Q. And do you know that Dr. -- or -- Dr. Lee was a
10 consultant to BATCo?

11 A. I don't know that. I don't know Lee.

12 Q. Can you go down to the next paragraph, starting
13 with "The concept...", do you see that?

14 A. Yes.

15 Q. "The concept of such a critical number of
16 cigarettes seems scientifically complete nonsense to
17 me. The large studies of lung cancer all indicate
18 that a fairly smoothly increasing risk with
19 increasing amount smoked which is approximately
20 linear." Do you see that?

21 A. I see that.

22 Q. Now, sir, you are aware, are you not, that in
23 1978 Gori was subject to tremendous criticism by the
24 overwhelming weight of scientific authority?

25 MR. WEBER: Let me object to counsel

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10476

1 testifying, Your Honor.

2 THE COURT: Rephrase the question, counsel.

3 Q. Do you know if Dr. Gori was subject to
4 tremendous criticism by the overwhelming weight of
5 scientific authority?

6 A. I think your question is extremely general. I
7 think Dr. Gori was criticized from a number of
8 quarters for pursuing what he called less-hazardous
9 cigarettes at a time when government policy seemed to
10 be shifting toward cessation rather than trying to
11 make a safer cigarette. He certainly was attacked
12 from a number of quarters, no question about it.

13 Q. In fact, the scientists felt his papers were
14 very simplistic; did they not?

15 A. Well I don't -- I don't know that that's an
16 accurate characterization or not. I mean we see in
17 this document Lee, whoever he is, certainly was --
18 was not accepting Gori's theory that there was some
19 critical level below which there was not a
20 statistically significant risk of lung cancer. It
21 seems like a scientific debate to me.

22 Q. It does. All right.

23 Can you go to the next page, very last
24 paragraph.

25 A. Yes.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

1 Q. "All in all, the paper is scientifically very
2 simplistic. It is remarkable that an NCI scientist
3 should get involved in what is effectively brand
4 advertising. The adverse reactions Gori got from
5 other scientists were not at all surprising."
6 Correct?
7 A. That's what this says.
8 Q. So this is an internal company document which is
9 stating that Gori's work is completely nonsense and
10 that the adverse reactions he got from other
11 scientists was not at all surprising; correct?
12 A. Seems to be Mr. Lee's conclusion.
13 Q. And can you turn, sir, to Exhibit 10710.
14 A. Did you say 10170?
15 Q. 10710.
16 A. Okay. I'm there.
17 Q. This is a Philip Morris memorandum dated August
18 7th, 1979 from Dr. Wakeham to Mr. Hugh Cullman,
19 subject, "Dr. Gio Gori;" is that correct?
20 A. It appears to be, yes.
21 MR. CIRESI: Your Honor, we'd offer Exhibit
22 10710.
23 MR. WEBER: No objection, Your Honor.
24 THE COURT: Court will receive 10710.
25 BY MR. CIRESI:

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

1 Q. Now do you know if Dr. Gori in 1978 and 1979 was
2 looking for employment?
3 A. I don't know details to answer your question
4 specifically. I know that the Tobacco Working Group
5 had been abandoned at that time. I know that Dr.
6 Gori was the subject of criticism, at least for --
7 from some people within the U.S. government.
8 Q. You don't --
9 You don't know, then, if he was looking for
10 employment or not; is that what you're saying?
11 A. I don't know whether he was looking for
12 employment specifically.
13 Q. Let's look at what Dr. Wakeham is saying in
14 August of 1979.
15 "I have just received a copy of Dr. Gori's
16 vitae" --
17 And that's a summary of his background; is that
18 a fair statement?
19 A. That's a fair characterization.
20 Q. -- "and I must say that it is more impressive
21 than I anticipated. Curtis Burton, Jr., has had a
22 long association with the Research Center as a
23 professional personnel recruiter."
24 Now this would be the Research Center at Philip
25 Morris; correct, sir?

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

1 A. I think that would be a reasonable assumption
2 the way this is written. It's not explicit.
3 Q. "Although he is also a friend of Dr. Gori" --
4 I'm sorry. "Apparently he is also a friend of Dr.

5 Gori and that is how I received this information. I
6 felt -- I spoke with Dr. Gori in New York about a
7 month ago and he is definitely looking for a job. I
8 know that the idea of setting him up in a public
9 health chair at Cornell University supported by the
10 tobacco industry has been rejected by Mr. Goldsmith."

11 Now do you know who Mr. Goldsmith was?

12 A. No, I don't.

13 Q. If I tell you that he became president of Philip
14 Morris, will you accept that?

15 A. I have no reason to doubt it or to accept it. I
16 just don't know.

17 Q. And Dr. Wakeham goes on to say, "I nevertheless
18 feel that somewhere, somehow Dr. Gori could be
19 helpful to the industry in the smoking and health
20 field. Certainly his acquaintanceship and
21 professional associations exist on an international
22 scale. Could he be useful to ICOSI?" Do you know
23 what that is?

24 A. No.

25 Q. Now it wasn't too long after that that Dr. Gori

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953

CROSS-EXAMINATION - DAVID E. TOWNSEND

10480

1 became a consultant to the tobacco industry; isn't
2 that right, sir?

3 A. I don't know. As -- as I said yesterday, I know
4 he's consulted with one of my competitors. I don't
5 know when he began consulting with my competitor.

6 Q. Can you direct your attention, then, to Exhibit
7 11101. This is is B.A.T. Company document entitled
8 "Group Research and Development Centre," do you see
9 that, sir?

10 A. It appears to be a B.A.T. Company document. I
11 don't think the title of it is as you said, though.
12 The title is on the second page.

13 Q. If you turn to the next page you'll see it.
14 "EXAMINATION OF A CONCEPT PROPOSED BY GORI FOR RATING
15 CIGARETTES," do you see that?

16 A. Yes.

17 MR. CIRESI: Your Honor, we'd offer Exhibit
18 11101.

19 MR. WEBER: No objection, Your Honor.

20 THE COURT: Court will receive 11101.

21 BY MR. CIRESI:

22 Q. Can you turn to paragraph -- or page six, and
23 that's at the top, sir, page six at the top of this
24 document relating to examination of a concept
25 proposed by Gori for rating cigarettes. Do you see

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953

CROSS-EXAMINATION - DAVID E. TOWNSEND

10481

1 there the paragraph entitled "Viability of the
2 Concept?"

3 A. Yes.

4 Q. "It is important to point out that while the
5 philosophy behind the Gori concept has certain merits
6 it was not at all well received. Indeed, it was the
7 subject of severe public criticism, most of which
8 emanated from Gori's colleagues and affiliates in the
9 NCI" --

10 That's the National Cancer Institute; correct?
11 A. Yes.
12 Q. -- "who were afraid that their general policy
13 and anti-smoking efforts would be seriously
14 undermined." Correct?
15 A. That's what it says.
16 Q. Now this again is a BATCo document; correct?
17 A. It appears to be, yes.
18 Q. And when you talk about your competitor that
19 hired Dr. Gori, that would be Brown & Williamson,
20 who's part of the B.A.T family of companies; isn't
21 that right?
22 A. That's correct.
23 Q. And BATCo is part of the B.A.T family of
24 companies; correct?
25 A. Yes.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10482

1 Q. Now sir, can you go back to Exhibit 4994, which
2 was the report of the proceedings of the FTC
3 conference that you attended in 1994. Do you have
4 it, sir?
5 A. Yes.
6 Q. Okay. Can you turn to page 113.
7 A. Okay.
8 Q. Now one of the subjects discussed at this
9 proceeding was the nicotine pharmacology and its
10 addictive effects; correct?
11 A. Dr. Henningfield did present information on
12 pharmacology of nicotine.
13 Q. And you were present during that presentation;
14 correct?
15 A. Yes.
16 Q. You participated in it?
17 A. I participated in the NCI conference, yes.
18 Q. And let's go to the introduction of that article
19 and presentation by Dr. Henningfield and Leslie
20 Schuh. And halfway through, do you see the reference
21 to "Henningfield et al., 1994?"
22 A. Yes.
23 Q. Okay. "An understanding of the
24 dependence-producing and other behavior-modifying
25 effects of cigarette smoke is necessary to understand

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10483

1 why the FTC method is a poor predictor of the
2 nicotine, tar, and carbon monoxide levels people
3 obtain from cigarettes. Cigarette smoking behavior
4 is influenced by nicotine dose, and smokers tend to
5 maintain nicotine intake within upper and lower
6 boundaries."
7 Now that's talking about a threshold level and
8 an upper level for nicotine; isn't it, sir?
9 A. He didn't use the word "threshold." He said
10 "maintain nicotine intake within upper and lower
11 boundaries."
12 Q. Well you would agree with me that the lower
13 boundary would be the threshold level of the dose --
14 A. Well --

15 Q. -- of a drug; would it not?
16 A. Well I think it depends on the context in which
17 it's being used.
18 Q. In this context, that's how it's being used;
19 isn't it, sir?
20 A. Well I'm not entirely sure. I mean he -- he
21 says "upper and lower boundaries," he didn't say
22 "threshold."
23 Q. Well he goes on to state, "In brief, nicotine
24 produces dose-related tolerance, physical dependence,
25 and discriminative effects (i.e., effects that people
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10484

1 can feel, which modify mood and physiology), and
2 smokers change their behavior in response to these
3 effects. Unlike human smokers, machines are not
4 nicotine dependent, nor do they modify their behavior
5 based on the flavor of the smoke." Correct?
6 A. That's what it says.
7 Q. And that's based on the studies that Dr.
8 Henningfield did; correct?
9 A. Well he's referenced himself in 1994. He also
10 referenced another researcher, Kozlowski, 1989.
11 Q. And there were other --
12 A. This is -- this is a summary of his opinions.
13 Q. And there were other doctors who had
14 investigated that issue and researched it and
15 published in the field; correct?
16 A. Are you saying in general in the field of
17 pharmacology of nicotine?
18 Q. In smoking and nicotine addiction as of 1994.
19 A. Well there are a number of papers in the area of
20 nicotine, nicotine addiction, and smoking behavior.
21 There's -- there's quite a lot.
22 Q. And indeed, Dr. Henningfield goes on and talks
23 about those down in "Addiction Severity, CIGARETTE
24 SMOKING AS DRUG DEPENDENCE;" doesn't he?
25 A. There's a section here "CIGARETTE SMOKING AS
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10485

1 DRUG DEPENDENCE," subtitle "Addiction Severity."
2 Q. And he states in this section, "Several findings
3 bear on the issue of the strength of dependence on
4 cigarettes. Although 70 to 90 percent of smokers are
5 interested in quitting, only one in three succeeds
6 before age 65," with a cite to Fiore, 1992. "There
7 is good and bad news about coronary bypass surgery
8 and even a lung removal. The good news is that these
9 traumatic events are among the most powerful
10 incentives to quit smoking. If one intervenes with
11 patients who undergo these procedures, about one-half
12 of them quit. However, the bad news is that the
13 other half or more soon return to smoking," and he
14 cites to the United States Department of Health and
15 Human Services in 1988 report; correct?
16 A. That's --
17 MR. WEBER: Objection, Your Honor, we're
18 well beyond the scope of the direct again.
19 THE COURT: Well you can answer that.

20 Q. Is that right, sir?
21 A. That's what's said here.
22 Q. And we're talking about in this section
23 compensation and whether the FTC method of reporting
24 gives meaningful information to smokers; aren't we?
25 A. Well in the paragraph that you read in the
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10486

1 introduction, it sounds to me like he's -- he's
2 reiterating actually something that I said, which is
3 that machine smoking can't -- can't determine what
4 each individual smoker can get or does get because
5 smoking behavior is -- is quite variable from
6 individual to individual, and even within
7 individuals.
8 Q. And because of that, the FTC-required disclosure
9 of nicotine and tar in any advertisements does not
10 accurately reflect what smokers get because of
11 compensation; correct, sir?
12 A. I'm sorry, you said because of what?
13 Q. Compensation.
14 A. I'm sorry, can you read the question back?
15 Q. Sure.
16 A. It sounded -- I didn't understand the first
17 part.
18 Q. Because of that, the FTC-required disclosure of
19 nicotine and tar in any advertisements does not
20 accurately reflect what smokers get because of this
21 compensation factor; isn't that right?
22 A. Because of compensation, the FTC required
23 disclosure of tar and nicotine?
24 Q. That's not -- no, that's not what I said, sir.
25 A. Well then --

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10487

1 Q. The FTC --
2 A. Rephrase it, then, please, because I didn't
3 understand what you were asking.
4 Q. I'll rephrase it for you.
5 The FTC disclosure does not accurately reflect
6 what a smoker gets. Do you agree with that?
7 A. The FTC tar and numbers -- tar and nicotine
8 numbers that are disclosed for each brand in the
9 United States does not accurately reflect what any
10 individual smoker will get. The FTC commissioners
11 have said that when they --
12 The FTC commissioner said that when the program
13 was started; other FTC commissioners have reaffirmed
14 that since.
15 Q. And Reynolds has never warned about that;
16 correct?
17 A. Reynolds has never issued any notice, to my
18 knowledge, informing smokers that -- that what they
19 get depends on -- is determined by how they smoke. I
20 think the FTC has made that clear, there's been some
21 public-domain documents that have made that clear,
22 and I think it's common sense, too, --
23 Q. Well I --
24 A. -- that if one puffs harder or -- or less, that

25 you would get more or less. A lot like EPA gas
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND
10488

1 mileage, I suppose.
2 Q. Like EPA gas mileage; is that what you said?
3 A. It's -- it's a reasonable analogy because
4 consumers make purchases of certain automobiles, in
5 part, based on EPA gas-mileage ratings. Those are
6 laboratory measurements and don't reflect what any
7 individual driver would necessarily get.
8 Q. What kind of gasoline is used in the EPA mileage
9 test?
10 A. I don't know.
11 Q. Have you ever heard of Indolene?
12 A. No.
13 Q. Do you know the aromatic composition of that
14 gasoline?
15 A. No, I don't.
16 Q. Do you know the paraffinic aspects of it?
17 A. No. No.
18 Q. Do you know how the test is conducted?
19 A. No.
20 Q. Let's get back to cigarettes, doctor.
21 The reason that there is a differing intake by
22 smokers is because of compensation; correct?
23 A. Smokers smoke differently. I think it's a very
24 complex human behavior that is probably different
25 from subject to subject. Certainly nicotine levels

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND
10489

1 are important in compensation, taste is important in
2 compensation, and we've done studies at Reynolds that
3 show simple changes in the pressure drop can
4 influence smoking behavior.
5 Q. And Reynolds has known of all those and has
6 never ever disclosed that in any advertisement or
7 publication to the public; have they?
8 A. Well I think you asked -- asked me that question
9 just a minute ago, and -- and my answer was and still
10 is that Reynolds, to my knowledge, has never
11 published an advertisement to consumers that what
12 they get depends on how they smoke. I do think
13 that's common sense and -- and common -- common
14 wisdom.
15 Q. Can you direct your attention to Exhibit 12366.
16 A. Okay.
17 Q. Do you have it, sir?
18 A. Yes.
19 Q. That's a March 28, 1972 memorandum, RJR
20 confidential; correct, sir?
21 A. This is an RJR document marked confidential.
22 The date is March 28, 1972.
23 Q. And the author is Dr. Claude Teague?
24 A. That's correct.
25 Q. And it's sent to Mr. Vassallo and Dr. Senkus;

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND
10490

1 correct?
2 A. That's correct.
3 Q. And it talks about "A GAP IN PRESENT CIGARETTE
4 PRODUCT LINES AND AN OPPORTUNITY TO MARKET A NEW TYPE
5 OF PRODUCT;" correct?
6 A. That's the title of this document.
7 MR. CIRESI: Your Honor, we would offer
8 Exhibit 12366.
9 I believe it's in already.
10 MR. WEBER: I think it is.
11 BY MR. CIRESI:
12 Q. Can you direct your attention to the first page,
13 sir.
14 A. Yes.
15 Q. And here Dr. Teague is talking about an
16 opportunity to market a unique new type of cigarette;
17 correct?
18 A. I think that's the -- the general -- or a
19 general part of this discussion. Can you refer me to
20 a specific line?
21 Q. Sure. At the very first paragraph in the
22 summary.
23 A. Okay.
24 Q. Do you see there where he says "hence an
25 opportunity to market a unique new type of

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10491

1 cigarette?"
2 A. In the first paragraph?
3 Q. Yes, right in the first line -- or first
4 sentence, excuse me, of the paragraph.
5 A. Okay. I see it.
6 Q. Do you see it?
7 A. Yes.
8 Q. "...hence an opportunity to market a unique new
9 type of cigarette. The gap exists because no
10 cigarette is presently marketed which has both an
11 acceptable level of nicotine and a 'tar'-to-nicotine
12 ratio of less than 13." Do you see that?
13 A. That's what it says.
14 Q. And if you go down into the next paragraph, the
15 second sentence, do you see where it says --
16 Well let's start with the first sentence.
17 "Tar/nicotine is simply a way of expressing the
18 number of milligrams of 'tar' a smoker must receive
19 per milligram of smoke nicotine. In today's market,
20 it is fair to assume that the smoker will choose the
21 product which delivers the desired amount of nicotine
22 with the least amount of 'tar', provided flavor and
23 other qualities are good." Do you see that?
24 A. I see that, and it sounds just like the Russell
25 hypothesis of medium tar, maintaining -- I mean,

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10492

1 sorry, maintaining nicotine at some acceptable level
2 and reducing tar as -- as low as one can. I think
3 it's the same concept.
4 Q. And it relates to the fact that Reynolds was
5 going to make cigarettes at certain nicotine levels

6 that would be acceptable to the consumer; correct?
7 A. I think the -- the assumption behind that theory
8 is that there's some level of nicotine-to-tar
9 ratio -- or he's actually flipped it around and
10 calling it a tar-to-nicotine ratio -- that is
11 acceptable and maintaining very low tar levels.
12 Q. And that's because Dr. Teague believed that
13 nicotine was the dominant specification of any
14 cigarette product; correct, sir?
15 A. Over the last few years I've read a lot of Dr.
16 Teague's memos, and my overall conclusion on Dr.
17 Teague is he certainly thought nicotine was extremely
18 important in the smoking process. I think he also,
19 from a number of his documents, probably concluded
20 that nicotine was the main reason or the -- even a --
21 to go to the extreme, probably the only reason that
22 people smoke. I don't agree with that, however.
23 Q. Why don't you direct your attention to page
24 three and the second full paragraph. "I believe that
25 for the typical smoker nicotine satisfaction is the

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10493

1 dominant desire, as opposed to flavor and other
2 satisfactions." Correct?
3 A. Yes, and that's consistent with what I just
4 said.
5 Q. He didn't say it was the only, he said it was
6 the dominant desire; correct?
7 A. That's what he says here. Some of his other
8 documents would suggest that he would consider it the
9 only reason.
10 Q. And you've said that if you reduced nicotine
11 down to a certain level, you wouldn't be selling any
12 cigarettes; haven't you?
13 A. What I said yesterday is if cigarettes contained
14 no or extremely, extremely low levels, those products
15 are certainly not consumer acceptable.
16 Q. And what Dr. Teague says in that regard in this
17 paragraph is "What the smoker basically wants, I
18 believe, is nicotine satisfaction accompanied by
19 acceptable flavor and mildness. Therefore, in
20 designing any cigarette product, the dominant
21 specification should be nicotine delivery." Correct?
22 A. That's what he says here, and that's consistent
23 with my summary of Dr. Teague's opinion on the
24 importance of nicotine. As I said, I don't agree
25 with that.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10494

1 Q. And if you direct your attention --
2 And this is in 1972; correct, sir?
3 A. This is in 1972.
4 Q. Can you direct your attention, then, to Exhibit
5 13139.
6 A. I'm sorry, what was that number again, sir?
7 Q. 13139.
8 Do you have that, sir?
9 A. Yes.
10 Q. Okay. This is a Reynolds document, "PRODUCT

11 DIFFERENTIATION GROUP;" correct?
12 A. Certainly appears to be a Reynolds document. It
13 does say "PRODUCT DIFFERENTIATION GROUP."
14 Q. And you recognize the names on that document?
15 A. Yes.
16 MR. CIRESI: Your Honor, we'd offer -- or I
17 think it's in evidence, 13139.
18 Q. Have you seen this before?
19 MR. WEBER: I think it is in, Your Honor.
20 Q. Have you seen this before, sir?
21 A. Yes, I have. You produced this for my
22 cross-examination.
23 Q. And do you know the date of the document?
24 A. I don't see a date on it so far. Data in the
25 accompanying tables says November 1990.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10495

1 Q. Has to be at least 1990; correct?
2 A. I would assume so.
3 Q. And if you'd turn to the second page, do you see
4 the issue regarding "THE OVER-SMOKING ISSUE?"
5 A. There's a title that says "THE OVER-SMOKING
6 ISSUE (Tar to Nicotine Ratio)."
7 Q. And it points out here that "It has been argued
8 for several years that low tar and ultra-low tar
9 cigarettes are not really what they are claimed to
10 be. Numerous investigators from the United States,
11 Canada and the United Kingdom have studied the way in
12 which smokers smoke full flavor (FF) full flavor low
13 tar (FFLT) and ultra-low tar (ULT) cigarettes and
14 have concluded that:
15 "Each individual smoker has his or her own
16 nicotine requirement from each cigarette;" correct?
17 A. That's what it says.
18 Q. And number two, "Virtually all cigarettes can be
19 made to yield the desired amounts of nicotine
20 depending upon the size of the puff taken and the
21 extent to which the puff is inhaled. (This is
22 referred to by some as the smoking maneuver)."
23 That's compensation; isn't it, sir?
24 A. In a general sense this, I think, speaks to
25 compensation.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10496

1 Q. Then it goes on to state that "The amount of tar
2 yielded by a full flavor, full flavor low tar or
3 ultra low tar cigarette (per milligram of nicotine)
4 is not appreciably affected by the smoking maneuver."
5 Do you see that?
6 A. Yes, I see that. And I think what that's
7 referring to is that the tar-to-nicotine ratio
8 doesn't change substantially as a -- as a result of
9 the changes in the smoking maneuver.
10 Q. And so applying those conclusions to an
11 ultralight cigarette, the argument can be constructed
12 that ULT advertising is misleading to the smoker;
13 correct?
14 A. I'm sorry, where do you see that?
15 Q. Right below number three.

16 A. That's what it says.
17 Q. Now this --
18 A. This sounds -- this sounds like a survey of the
19 literature in the area of over-smoking or
20 compensation.
21 That's what it says.
22 Q. And this is --
23 This is referring to the Reynolds advertising;
24 isn't it, sir?
25 A. I don't know what you mean by "referring to
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10497

1 Reynolds advertising."
2 Q. The ULT advertising is misleading to the smoker.
3 A. As I read this document, I think it is a review
4 of the literature in the area of compensation. It
5 just says here "Applying the above considerations to
6 the ULT cigarettes (the argument can be constructed)
7 that ULT advertising is misleading to the smoker."
8 Q. And these individuals at Reynolds were reviewing
9 this information pursuant to their responsibility to
10 keep abreast of the scientific literature; isn't that
11 correct?
12 A. We have scientists in the R&D department who
13 have conducted research in the area of compensation.
14 To conduct their research, one needs to understand
15 the scientific literature.
16 Q. And as a result of this memorandum, Reynolds
17 didn't change its advertising; did it? If you know.
18 A. Well our advertising changes a lot. In the
19 sense that you're talking about, I'm not aware of
20 major shifts in advertising of ULT cigarettes.
21 Q. And if you could go back, now, to Exhibit 12366,
22 Dr. Teague's memorandum of 1972, about 18 years
23 before this, --
24 A. Okay.
25 Q. -- and if you go to page seven.
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10498

1 A. All right.
2 Q. Under "DISCUSSION AND RECOMMENDATIONS," I'd like
3 to direct your attention to the last paragraph
4 starting "In theory, and probably in fact...." Do
5 you see that?
6 A. Yes.
7 Q. "In theory, and probably in fact, a given smoker
8 on a given day has a rather fixed per hour and per
9 day requirement for nicotine. Given a cigarette that
10 delivers less nicotine than he desires, the smoker
11 will subconsciously adjust his puff volume and
12 frequency, and smoking frequency, so as to obtain and
13 maintain his per hour and per day requirement for
14 nicotine (or, more likely, will change to a brand
15 delivering his desired per cigarette level of
16 nicotine). Thus, despite the philosophy of our
17 critics, there can be no virtue or logic in reducing
18 per cigarette nicotine level below that desired by
19 the smoker. Additionally, if this is true, and if
20 all leading cigarette brands deliver about the same

21 amount of tar per unit of nicotine -- that is, all --
22 that is, all have about the same tar/nicotine
23 ratio -- then regardless of which cigarette the
24 smoker chooses, in obtaining his daily nicotine
25 requirement he will receive about the same daily

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953

CROSS-EXAMINATION - DAVID E. TOWNSEND

10499

1 amount of 'tar.'" Correct?

2 A. That's what it says. And it sounds really
3 familiar to the Russell hypothesis that we've already
4 discussed, in a general sense.

5 Q. Now sir, Reynolds over the years, then,
6 conducted studies and did focus groups on these
7 issues; didn't they?

8 A. We conducted focus groups on -- and evaluated
9 some of our medium tar -- I mean -- I'm sorry --
10 medium nicotine/low tar products, the prototypes,
11 where we've taken to consumers the idea that this is
12 reduced tar, very low level tar product, and here's
13 the concept, and we tried to evaluate their taste
14 characteristics among those consumers. We've also
15 evaluated in -- in mail-out consumer testing various
16 prototypes from the projects that we discussed
17 yesterday or the day before, I can't remember now,
18 the projects such as XB, GT, XGT, and the Russell
19 project, where we've tried very hard to make
20 consumer-acceptable products that have medium
21 nicotine/low tar. This is consistent with that.

22 Q. Yeah. And what you did is you found that
23 smokers did dramatically overcompensate; didn't you,
24 sir?

25 A. In what circumstance?

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953

CROSS-EXAMINATION - DAVID E. TOWNSEND

10500

1 Q. In circumstances of smoking low tar cigarettes,
2 they compensated by having greater puffs, deeper
3 puffs, and smoked more cigarettes.

4 A. What we found in our research in the area of
5 compensation and -- and internal to Reynolds and also
6 in reviewing the -- the wealth of information in the
7 scientific literature on smoker compensation, is that
8 if one switches, a person -- for example, if -- if a
9 regular smoker of a -- of a full-flavor cigarette,
10 one of the higher tar products, is given an
11 ultralight tar product, so it's a switching study,
12 the smoker will very quickly compensate to a degree.
13 They will puff that cigarette somewhat -- with a --
14 with a somewhat larger puff volume, they will puff
15 somewhat more frequently. The duration of the puff
16 seems to be relatively insensitive to compensation,
17 but certainly puff volume will increase a bit, the
18 frequency will become more often, a bit, and overall
19 the yields that that person would be expected to get
20 would be slightly higher, somewhat higher than the
21 FTC tar number would predict. But they still get
22 less even with that compensation in a switching
23 study.

24 We talked --

25 Q. Are you done?

10501

1 A. Yes.
2 Q. Okay. And what you found is that you're
3 developing greater incidence of cancer and deeper
4 cancers within the lungs; correct?
5 MR. WEBER: Objection, Your Honor, it's
6 beyond the scope of the direct again.
7 THE COURT: Well I think he's just gone
8 extensively into compensation. He can ask now.
9 Q. Isn't that right, sir?
10 A. And your question is? I'm sorry.
11 Q. And what we found is that that causes increased
12 lung cancer and deeper lung cancers in the lung;
13 correct?
14 A. No, I don't -- I don't think that's correct. I
15 think there have been several hypotheses about the
16 effects of compensation. Certainly smokers, even
17 with compensation, as a group, as a group, ULT or
18 ultra low tar smokers as a group get less.
19 Individuals vary, certainly, but the group gets less
20 than if they were smoking a high tar cigarette.
21 Q. Can you direct --
22 A. And --
23 Q. -- your attention to Exhibit 26132. It's in
24 volume two.
25 In keeping abreast of the medical literature,

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10502

1 you read various medical articles; don't you, sir?
2 A. From time to time I'll read articles from the
3 medical literature and understand what I can from it,
4 which sometimes varies.
5 Q. And you read the medical morbidity weekly
6 reports; don't you?
7 A. No, I don't.
8 Q. Never read them?
9 A. I've seen them. I thought you were referring to
10 regular reading --
11 Q. Oh, regular. I see.
12 A. -- reports.
13 Q. But you have read them is what I'm saying.
14 A. I have seen reports of that nature.
15 Q. All right. Can --
16 And Exhibit 23162 is one of those; correct?
17 It's a Morbidity Mortality Weekly Report.
18 A. I don't know that this is a weekly report. I
19 just don't know.
20 Q. It's right at the top.
21 A. It says MMWR.
22 MR. CIRESI: Your Honor, we'd offer Exhibit
23 26132.

24 MR. WEBER: I'd object on the basis it's
25 beyond the scope of the direct, Your Honor, and
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10503

1 there's no foundation with this witness with respect

2 to --

3 MR. CIRESI: This addresses --

4 MR. WEBER: Excuse me.

5 MR. CIRESI: Go ahead.

6 MR. WEBER: There's no foundation with this

7 witness with respect to this specific document, at

8 least none has been laid yet.

9 MR. CIRESI: Your Honor, this specifically

10 addresses ventilation and compensation, which he has

11 talked about extensively.

12 THE COURT: It seems to be directed to that

13 issue of compensation that he's just elaborated on

14 for the last 10 minutes, so I'll allow it.

15 26132 will be received.

16 BY MR. CIRESI:

17 Q. Now sir, this is a November 7th, 1997 Morbidity

18 Mortality Weekly Report. Do you see that at the top?

19 If you turn to the second page you'll see the

20 date, sir.

21 A. Yes, it says November 7, 1997.

22 Q. And on page one it's talking about "Filter

23 Ventilation Levels in Selected U.S. Cigarettes;"

24 correct?

25 A. There is a section entitled "Filter Ventilation

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953

CROSS-EXAMINATION - DAVID E. TOWNSEND

10504

1 Levels in Selected U.S. Cigarettes, 1997."

2 Q. Okay. And could you turn to page two, second

3 page, and do you see the editorial note down at the

4 bottom?

5 A. Yes.

6 Q. Okay. And it reports that "From 1954 to 1994,

7 sales-weighted tar yields of cigarettes declined from

8 an estimated average of 37 milligrams of tar to 12

9 milligrams of tar, respectively." Correct?

10 A. That's what it says.

11 Q. And that's consistent with what you've testified

12 here to; correct?

13 A. Yes, it is.

14 Q. And did you also --

15 You said you also reviewed testimony of other

16 witnesses; correct?

17 A. In this trial?

18 Q. Yes.

19 A. I've reviewed some of the testimony of a few

20 witnesses. I've certainly not looked at all of the

21 testimony of even those witnesses, but some of it.

22 Q. All right. Are you aware whether or not Dr.

23 Hurt, Dr. Robertson and others testified to that

24 reduction in tar over time?

25 A. I don't know about Dr. Hurt. I think Dr.

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953

CROSS-EXAMINATION - DAVID E. TOWNSEND

10505

1 Robertson did. Robertson did speak to tar reduction.

2 Q. Okay. Now --

3 And the testimony you reviewed was consistent

4 with what you talked about with regard to tar

5 reduction; correct?

6 A. Well that's a pretty broad question. I think

7 there was some -- some reference in the testimony
8 about tar reduction in the U.S. market.
9 Q. Okay.
10 A. In a general sense I agree with that.
11 Q. And you used Dr. Samet's exhibit. Do you
12 remember that?
13 A. Certainly.
14 Q. And do you know if he testified about the
15 reduction in tar over time?
16 A. In this trial?
17 Q. Yes.
18 A. I believe he did, yes.
19 Q. Now if we go back, then, to Exhibit 26132, it
20 says there that "Despite this decline in tar
21 yields -- attributable, in part, to the increased use
22 of filter ventilation -- the" --
23 A. Excuse me. Excuse me, sir. Where are you?
24 Q. Page two, right where we were.
25 A. Okay. Thank you.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10506

1 Q. Second sentence right after the reference to how
2 the tar was reduced.
3 A. Thank you. I just want to follow along with
4 you.
5 Q. Have it? All right.
6 "Despite this decline in tar yields --
7 attributable, in part, to the increased use of filter
8 ventilation -- the relative risk of lung cancer has
9 increased, even when accounting for the delayed onset
10 of mortality from tobacco-linked lung cancer." Do
11 you see that?
12 A. I see where it says that.
13 Q. And is Reynolds aware of that information, to
14 your knowledge?
15 A. Well I -- I don't know. Our scientists read the
16 external literature extensively. I would assume that
17 they've read this, but I don't know specifically.
18 Q. And then it goes on to state, "Factors
19 potentially associated with increase in
20 smoking-related mortality are an increase in the
21 number of cigarettes smoked (and therefore, tar
22 exposure) by persons who use reduced-tar brands,
23 inhaling more deeply, and an increased frequency of
24 puffing." Do you see that?
25 A. I see that.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10507

1 Q. "In addition, smokers who use reduced-tar
2 cigarettes may be blocking some of the filter vents
3 with their fingers or lips, thereby increasing their
4 exposure to the carcinogens in cigarette smoke." Do
5 you see that?
6 A. I see that.
7 Q. Goes on to state, "Compensatory changes in
8 smoking behaviors among persons who smoke reduced-tar
9 cigarettes could be associated with changes in risk,
10 histology, and site of lung cancers." Do you see
11 that?

12 A. I see that.
13 Q. Now have you become aware at all of the fact
14 that as a result of low tar cigarettes, the medical
15 world is seeing deeper cancers in the lung?
16 MR. WEBER: Let me object to that. He's
17 testifying, Your Honor.
18 THE COURT: You can rephrase that question.
19 MR. CIRESI: Let me restate it.
20 BY MR. CIRESI:
21 Q. Do you know if, because of low tar cigarettes,
22 the medical world is seeing deeper cancers in the
23 lung? Do you know?
24 A. Let me tell you what I do know. I know that
25 there are theories that the types of lung cancer may
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10508

1 be changing, and there is the theory, at least by one
2 scientist that I'm aware of, that has suggested that
3 the switch to low tar cigarettes may be in part, if
4 not completely, responsible for that.
5 But you stated that question as if it were a
6 proven fact that lung cancer changes have occurred as
7 a result of that. I think it's a theory that only a
8 few scientists hold at this point.
9 Q. And do you know of the type of lung cancer
10 that's referred to as adenocarcinoma?
11 A. I'm aware of adenocarcinoma. And I think, for
12 example, Dr. Hoffmann's theory, he's -- he's one of
13 the persons who's advanced this theory, is that
14 there's been an increase in adenocarcinoma as a
15 result of lower tar products. Again, it's a theory
16 and I don't think there's evidence or supporting
17 evidence for that theory.
18 Q. Well there's --
19 You don't think there's supporting evidence to
20 say that smoking causes lung cancer yourself; do you?
21 A. Well I've already made it clear what I think
22 about that. Cigarette smoking is clearly a risk for
23 a number of diseases, including cancer. Does it
24 cause -- does cigarette smoking in itself cause lung
25 cancer and these diseases? It may, but I -- the
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10509

1 scientific evidence to prove it definitively is not
2 there.
3 Q. Okay.
4 A. But it certainly may.
5 Q. The answer to my question, then, is you don't
6 believe even today that smoking causes lung cancer.
7 I didn't ask if it may or if it presents risks, I
8 asked if it causes lung cancer.
9 A. You're asking me if I believe that it causes
10 lung cancer, and I'm telling you that I don't know
11 whether it does or it doesn't.
12 Q. Thank you, sir.
13 Now there are epidemiological studies that show
14 this deeper cancer; correct?
15 A. There are some data that I've seen, particularly
16 in Dr. Hoffmann's publications, that shows an

17 increase in adenocarcinoma together with a decrease
18 in squamous-cell carcinoma.
19 Q. And there's also studies showing that almost
20 two-thirds of U.S. smokers are either unaware of the
21 presence of vents on cigarettes or do not know that
22 tar yields increase when vents are blocked; isn't
23 that correct?
24 A. Where are you reading from?
25 Q. Last page of the exhibit.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10510

1 A. The last page?
2 Q. Yes.
3 A. Okay. Where on the page?
4 Q. Last -- last part of the page. I'm sorry, sir.
5 "An estimated two-thirds....," do you see that?
6 A. I see where you are.
7 Q. All right. Let me read that. "An estimated
8 two-thirds of U.S. smokers either are unaware of the
9 presence of vents on cigarettes or do not know that
10 tar yields increase when vents are blocked. Filter
11 vents can be difficult to see, which may account for
12 the high proportion of smokers (80 percent) of
13 'light' (6 to 15 milligrams of tar) and 'ultra-light'
14 (1 to 5 milligrams of tar) who are unaware of the
15 presence of vents on the brands they smoke. These
16 findings underscore the need for intensified efforts
17 to educate smokers about the risks associated with
18 smoking reduced-tar cigarettes." Do you see that?
19 A. I see that statement.
20 Q. And Reynolds has been aware of that for a number
21 of years; hasn't it, sir?
22 A. Has been aware of what, this -- this article?
23 Q. Of the fact that smokers were unaware of the
24 vents on the cigarettes.
25 A. I -- I don't think I can answer that as -- in a

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10511

1 blanket statement. I think that some discussions
2 we've had in focus groups with smokers has -- has
3 certainly suggested that some of them, particularly
4 the higher tar products that have -- of those that
5 are ventilated, have what we call electrostatic
6 perforations and are not readily visible -- readily
7 visible to the eye. It surprises some smokers. Some
8 smokers, however, particularly those of low tar and
9 ultra low tar, are clearly aware of the presence of
10 vents.
11 Q. How many studies has Reynolds done in that
12 regard, if you know?
13 A. Focus groups with -- with consumers?
14 Q. Yes.
15 A. I really don't know offhand.
16 Q. Now there are other problems that Reynolds is
17 aware about with regard to low tar cigarettes which
18 deal with mutagenicity; correct?
19 A. I don't know what you mean "problems." But go
20 ahead, ask me a question.
21 Q. Well do you know if Reynolds has knowledge that

22 low tar cigarettes have greater mutagenicity than
23 higher tar cigarettes?
24 A. As a general rule, the tools used in
25 constructing or the cigarette designs that result in
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10512

1 low -- especially ultra low tar products increases
2 the Ames mutagenicity of the smoke on a specific
3 activity basis. What that means is the -- the
4 activity is somewhat higher on a per milligram of
5 smoke basis or per milligram of tar basis. If one
6 calculates the overall activity per cigarette, that's
7 still dramatically reduced.

8 Q. Can you direct your attention, sir, to Exhibit
9 12784.

10 A. Okay.

11 Q. And this is a memorandum, handwritten memorandum
12 to Dr. Rodgman from Shin Lee of RJR dated February
13 25th, 1983, the subject is "Genotoxicity Testing
14 Programs?"

15 A. This does appear to be a handwritten memo from
16 Dr. Shin Lee to Dr. Rodgman. The subject is
17 "Genotoxicity Testing Programs."

18 MR. CIRESI: Your Honor, we'd offer Exhibit
19 12784.

20 MR. WEBER: No objection, Your Honor.

21 THE COURT: Court will receive 12784.

22 BY MR. CIRESI:

23 Q. Now the Ames test is a test utilized by
24 scientists to assess the mutagenic property of a
25 substance; correct?

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10513

1 A. The Ames test is a -- in my understanding -- is
2 a comparative test. The end point is genetic
3 mutagenesis.

4 Q. Have you ever conducted an Ames test yourself?

5 A. No, I haven't.

6 Q. Now "mutagenic" means physical changes in the
7 chromosomes; correct?

8 A. It does mean changes in the chromosomes or in
9 the genetic material.

10 Q. And it's a biological change in the codings that
11 make up the genes in an individual; is that correct?

12 A. I don't know the details of this test. What I
13 do know is it's a test that provides comparative
14 biological assays for a variety of things, including
15 cigarette smoke.

16 Q. If you direct your attention to number one
17 there, "Short term genotoxicity tests," do you see
18 that?

19 A. Yes.

20 Q. Is Shin Lee a doctor?

21 A. Yes, he is. He's retired from R. J. Reynolds at
22 this point.

23 Q. Ph.D.; correct?

24 A. Yes.

25 Q. Not a medical doctor.

STIREWALT & ASSOCIATES

10514

- 1 A. He's a Ph.D.
2 Q. Do you know what his area of specialty was?
3 A. Well he worked for many, many years in -- in the
4 area of Ames testing, trying to understand what Ames
5 tests tell us. He tried to develop and worked with a
6 number of other scientists to try to develop other
7 comparative biological assays of cigarette smoke. I
8 believe his background is a biochemist.
9 Q. Biochemist. Thank you.
10 He states here that "All of the available short
11 term bioassay systems have their limitations and,
12 therefore, the 'battery' is always recommended. Even
13 with a battery, qualitative measurement will be
14 different...." Do you see? "Even with a battery,
15 quantitative measurement will be different especially
16 with complex mixture like cigarette -- like smoke.
17 Nevertheless, to monitor the genotoxicity use of a
18 battery is essential. The battery may consist of the
19 following," and then he lists one, which is "Ames
20 test;" correct?
21 A. Yes. I have the same difficulty with that word
22 as you did, so we'll just have to guess what it was.
23 I think other than that you read it generally
24 correctly.
25 Q. Okay. If you could turn on to the next page

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10515

- 1 then. Now genotoxicity, do you know what that is,
2 just generally, sir?
3 A. Well in a general sense it's biological assays
4 measuring toxic -- or some toxicity end point in
5 genetic material.
6 Q. Whether it's toxic to genes; correct?
7 A. In a general sense.
8 Q. Whether it's mutagenic to genes; correct?
9 A. Well that's one particular end point of the
10 genotoxicity test.
11 Q. Number two, "Establishing the correlation
12 between the content of smoke and genotoxicity." Do
13 you see that?
14 A. Yes.
15 Q. "Is low tar smoke safer? There seems to be no
16 simple answer to this question. However, this is an
17 important question and the correct answer will
18 dictate the direction of our research effort. If a
19 low tar smoke is not safer it may be that the smoke
20 is low in the concentration of non-mutagenic and
21 anti-mutagenic. Our own experience with Ames tests
22 in various tar level smoke indicated a higher mutagen
23 rate per milligram of tar by low tar smoke reflecting
24 a different chemical composition of low tar smoke
25 from higher tar smoke."

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10516

- 1 Now sir, this was in 1983; correct?
2 A. This document appears to have been written in

3 1983.
4 Q. And I believe you said that the first low tar
5 smoke put on the market by Reynolds was in 1966; was
6 it?
7 A. Well it was in the late '60s. Vantage was the
8 first very successful low tar product sold by
9 Reynolds, and that was in the late '60s or maybe even
10 1970.
11 Q. Now the Ames test was available back in the
12 '60s; wasn't it?
13 A. You know, I don't know when the Ames test first
14 came on line.
15 Q. There were tests available in the '60s to
16 determine the mutagenicity of cigarette smoke; wasn't
17 there?
18 A. I don't know when the Ames test first came on
19 line.
20 Q. Do you know if there were any other scientific
21 tests available at that time to determine
22 mutagenicity?
23 A. I really, really can't --
24 I'm not sure about the timing.
25 Q. Now you are aware that Reynolds has conducted
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10517

1 tests which show that low tar smoke is more mutagenic
2 than higher tar smoke.
3 A. Reynolds has conducted a number of tests that
4 show in general ultra low tar cigarettes have a
5 higher mutagenic activity end point. They are more
6 mutagenic on a per milligram of tar basis. That's
7 what we call specific activity, that's activity per
8 milligram or per gram of tobacco.
9 If you look at the activity per cigarette,
10 because of the major tar reduction, the overall
11 mutagenicity per cigarette is still lower.
12 Q. But if someone is compensating, even assuming
13 what you just said is true -- and I'll accept that
14 for right now for the purposes of this question --
15 MR. WEBER: Let me object to the
16 commentary, Your Honor.
17 THE COURT: Well I don't think that's
18 commentary so much as introducing the question.
19 MR. CIRESI: I'm just --
20 BY MR. CIRESI:
21 Q. Assuming that is true, if someone compensates
22 and gets the same amount of tar, they're getting a
23 more mutagenic tar; correct, sir?
24 A. I don't know if that's the case or not. The
25 first thing is, assuming that that were true, which I

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10518

1 believe it to be true, that the per cigarette
2 mutagenicity is -- for ULTs is clearly and
3 substantially lower than high tar products per
4 cigarette, if one compensated fully, which I don't
5 believe cigarette smokers as a group do compensate
6 fully, but if we did assume that they did compensate
7 to get the same nicotine and the same tar, I -- I'm

8 not aware of any test that's been conducted under
9 extreme puffing conditions to generate tar and
10 compare Ames mutagenicity.
11 Q. You simply have never done that at Reynolds; is
12 that what you're saying?
13 A. Well I thought I described what I was saying.
14 What I'm saying is that Ames activity for ULT
15 cigarettes is clearly lower per cigarette -- on a per
16 cigarette basis. It's higher on a per milligram of
17 tar, but on a per cigarette basis it's lower.
18 Now if smokers compensate to get -- compensate
19 fully, as we call it -- and you've used the term as
20 well -- if the -- if a smoker compensates fully; that
21 is, to get exactly the same tar and same nicotine
22 that they would get if they were smoking a higher --
23 a high tar product, then -- which I don't believe
24 happens to -- for cigarette smokers as a group, by
25 the way, but if they did, we've not to my knowledge

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10519

1 measured the Ames -- or designed a test where we
2 changed smoking machines to puff so intensely to
3 cause that to happen and then compared the Ames
4 mutagenicity of the two.
5 Q. If there is higher mutagenicity per milligram of
6 tar in a low tar cigarette and one compensates to get
7 the same amount of tar as a high tar cigarette, that
8 individual is getting a more mutagenic smoke based on
9 Reynolds own research.

10 A. No, that's --

11 Q. At least as early as 1983.

12 A. That's not correct because it's not based on
13 Reynolds' own research. Because, as I told you, I
14 don't think that that experiment has ever been
15 conducted, trying to change the puffing behavior of
16 the smoking machine so intensely to get the same tar
17 and same nicotine per ULT as one would get for a
18 higher tar product, and then comparing the Ames
19 mutagenicity of that. I think --

20 I'm not aware that that experiment has been
21 done. I think some of the -- some of the changes in
22 Ames mutagenicity may be because of -- and we don't
23 really know exactly, I think there's been a lot of
24 research in this area, but my guess is that -- that
25 some of the changes in Ames activity may be a result

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10520

1 of selective filtration of certain things, which
2 then, if one puffs extremely intensely to get the
3 same tar level, then you wouldn't get the same
4 selective reduction of certain nitrogen compounds
5 that are important to the Ames mutagenicity test.
6 That's a hypothesis.

7 Q. I guess what you're saying is you just don't
8 know. Isn't that right?

9 A. I think I described what I -- what I know and
10 what I don't know, and I think --

11 Q. And --

12 A. And I think I've made it very clear what I know

13 and don't know.
14 Q. And you've never told smokers that you don't
15 know whether they get a more-mutagenic smoke with low
16 tar as opposed to high tar; have you?
17 A. The basic assumption that you made is smokers
18 compensate fully and get the same tar. I don't
19 believe that that's the case for smokers of the ultra
20 low tar products as a group. I understand that
21 smokers can smoke differently and that there's a
22 large variability in the way people smoke and -- and
23 puff cigarettes. But as a group, I think the
24 evidence is that there's not full compensation.
25 Compensation can and does occur to a degree, no

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953

CROSS-EXAMINATION - DAVID E. TOWNSEND

10521

1 question about it.
2 Q. Is your answer no?
3 A. I have --
4 I described my answer.
5 Q. Well the question was: You've never told
6 smokers that you don't know whether they get a more-
7 mutagenic smoke with low tar as opposed to high tar
8 cigarettes; have you?
9 A. With the background of my last answer, which
10 describes my opinion and my experience, the answer to
11 your specific question is I don't believe R. J.
12 Reynolds has told consumers exactly what you're --
13 what you said, because there's a lot of assumptions
14 in there.
15 Q. Now you said "as a group." How many in the
16 group compensate fully?
17 A. I don't understand that question.
18 Q. Because you don't know; do you, sir?
19 A. I don't understand your question.
20 Q. You said --
21 A. Scientists have conducted a number of studies
22 where they take different groups of people and they
23 measure smoking behavior. In some cases they'll
24 measure nicotine or nicotine metabolites in body
25 fluids and try to estimate overall exposure, and on

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953

CROSS-EXAMINATION - DAVID E. TOWNSEND

10522

1 the average smokers of ultra low tar products, from
2 the bulk of the literature that's comparable and the
3 studies that -- that are comparable so you don't
4 compare apples and oranges, on the average smokers
5 who smoke ULT products get less. They don't get as
6 little as you would expect based on the FTC numbers,
7 no question about it, they do compensate to a degree,
8 but compensation is not complete.
9 Q. What percentage of smokers, based on the
10 totality of the studies, compensate completely?
11 A. I don't know that I can answer that question.
12 Q. Simply don't know; do you, sir?
13 A. I don't know the answer to your very specific,
14 narrow question.
15 Q. You don't know if it's 10 percent or if it's 75
16 percent; do you?
17 A. Well I think that's -- I think that's not a fair

18 question. I've already told you that the average is
19 not full compensation, it's somewhere in the middle.
20 Q. Fifty percent is full compensation?
21 A. I don't know the answer to your very specific,
22 very narrow question. I really don't.
23 Q. If it's in the middle, it's 50 percent; correct?
24 A. If the average of groups of smokers is in the
25 middle between what the FTC tar would predict and

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953

CROSS-EXAMINATION - DAVID E. TOWNSEND

10523

1 between no change, i.e., a ULT smoker would receive
2 the same tar and same nicotine as a high tar smoker,
3 if it were in the middle, I would term that 50
4 percent compensation.
5 Q. And how many smokers would that be? Tens of
6 millions of smokers; wouldn't it?
7 A. I don't understand you.
8 Q. How many would be compensating at that level if
9 it was 50 percent?
10 A. At which level, sir?
11 Q. Fifty percent. How many would be compensating
12 at that level among smokers?
13 A. Well I guess -- I guess I'm struggling with your
14 question because I've already made it clear that
15 smoker behavior is extremely variable from smoker to
16 smoker and even within smokers. Smoker's behavior
17 changes even for themselves. I don't think we can
18 sit here and define percentages because of the large
19 variability --
20 Q. And that's my --
21 A. -- in the way --
22 Q. -- precise point, Dr. Townsend. And you,
23 Reynolds, has never warned the public of those
24 issues; have you? Never.
25 A. What issues specifically, sir?

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953

CROSS-EXAMINATION - DAVID E. TOWNSEND

10524

1 Q. Don't you know the issues we've been talking
2 about here?
3 A. I want to know specifically what you're asking
4 me.
5 Q. I'm asking you about the issues of compensation,
6 about mutagenicity, and about the fact that smokers
7 can get the same amount of tar with low tar
8 cigarettes as they can with a full-flavor cigarette.
9 Your company has never ever taken out any ad or
10 issued any warning to inform people of those issues;
11 have you?
12 A. Let me see if I understand your very specific
13 question. Has R. J. Reynolds ever warned its smokers
14 that compensation can occur?
15 Q. That's one part of it. Have you ever?
16 A. Not to my knowledge.
17 Q. Have you ever --
18 A. However, --
19 Q. Have you ever --
20 A. -- information about compensation is in the
21 scientific literature, and there's been a
22 considerable amount of information about compensation

23 in the public literature, and it's also in my opinion
24 common sense that if one puffs harder, one's going to
25 get more tar.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10525

1 Q. I didn't ask you those questions. We just saw
2 the Morbidity and Mortality Weekly Report that said
3 many of these people do it subconsciously; isn't that
4 right? Isn't that right, sir?

5 A. Well I don't remember that statement exactly.
6 We can go back there if you like.

7 Q. And the fact is Reynolds has never warned not
8 only of compensation, but of the health effects of
9 compensation; have they? Reynolds has never warned.

10 A. I'm not aware of R. J. Reynolds warning smokers
11 about the health effects of compensation. Clean
12 answer to your very specific question.

13 Q. And you have found that wider cigarettes with
14 expanded tobacco have higher mutagenicity; isn't that
15 correct?

16 A. No, that's not correct.

17 Q. You've seen no data to support that?

18 A. Show me what you're referring to. I don't
19 recall any data that shows higher-circumference
20 cigarettes to have higher mutagenicity on commercial
21 products from R. J. Reynolds.

22 Q. Reynolds marketed an expanded Camel; correct?

23 A. What -- what do you mean "expanded Camel?"

24 Q. Wider-circumference cigarette.

25 A. Oh, I thought you were talking about expanded

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10526

1 tobacco.

2 Q. Well they used expanded tobacco to market it;
3 didn't they?

4 A. There's expanded tobacco in virtually all of our
5 products.

6 Q. Can you direct your attention to Exhibit 24145.
7 Do you have it, sir?

8 A. Yes, sir.

9 Q. It's an RJR secret document dated October 15,
10 1987?

11 A. Looks like it.

12 Q. To Ann E. Biswell and Emily C. -- and we can't
13 make out her last name. Do you see that?

14 A. I see that, yes.

15 Q. Carbon copy to H. T. Parks?

16 A. Yes.

17 MR. CIRESI: Your Honor, we'd offer Exhibit
18 24145.

19 MR. WEBER: Your Honor, we object to that
20 and I'd like an opportunity to raise that with Your
21 Honor at side-bar.

22 THE COURT: All right. Why don't we take a
23 short recess, the jury will be excused, and you can
24 come up here.

25 (Jury leaves the courtroom.)

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953

1 THE CLERK: Court stands in recess.
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

1 (Side-bar discussion as follows:)
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

1
2
3

4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10530

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10531

1
2
3
4
5
6
7
8

9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10532

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10533

1
2
3
4
5
6
7
8
9
10
11
12
13

(Side-bar discussion concluded.)

14
15
16
17
18
19
20
21
22
23
24
25

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10534

1 THE CLERK: All rise. Court is again in
2 session.
3 (Jury enters the courtroom.)
4 THE CLERK: Please be seated.
5 THE COURT: Counsel.
6 MR. CIRESI: Thank you, Your Honor.
7 BY MR. CIRESI:
8 Q. Doctor, when we recessed, we were about to go to
9 Exhibit 24145.
10 MR. CIRESI: And Your Honor, we'd offer
11 that.
12 MR. WEBER: Same objection I expressed,
13 Your Honor.
14 THE COURT: Court will receive 24145.
15 BY MR. CIRESI:
16 Q. Can you turn to the second page, please, of that
17 document, which has the Bates number 6377. And that
18 has the date of October 15th you'll see at the top,
19 sir?
20 A. I see it. It is October 15, 1987.
21 Q. All right. And this is a document marked RJR
22 secret; correct?
23 A. Yes, it is.
24 Q. Now in your direct testimony you mentioned that
25 one of the general reduction techniques that was

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10535

1 utilized by Reynolds over the years was reduced
2 circumference of cigarettes; correct?
3 A. Reduced circumference is a general reduction
4 technique by virtue of reducing the total amount of
5 tobacco or total weight of tobacco that's burned.
6 That, together with shorter tobacco rods to reduce
7 the amount of tobacco burned, were tools for general
8 reduction. Not the more -- some of the more
9 important tools, but they certainly made -- made a
10 difference in the marketplace.
11 Q. My question is real simple and that was:
12 General reduction technique, one was reduced
13 circumference. "Yes" or "no."
14 A. That was a general reduction technique, yes.
15 Q. Expanded tobacco was another reduction technique
16 that you mentioned; correct?
17 A. That's correct.
18 Q. Now in 1987 Reynolds was looking at a wider-

19 circumference non-menthol cigarette targeted at
20 younger adult male smokers; correct?
21 A. In 1987 R. J. Reynolds was looking at a new
22 product that had a larger circumference. The smoker
23 group for that was younger adult smokers.
24 Q. And it was being explored as a Camel line
25 extension; correct?

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10536

1 A. That's correct.
2 Q. That means another product in the Camel line;
3 fair?
4 A. It's another brand style within the Camel
5 family, that's correct.
6 Q. And indeed, Reynolds did market a Camel with a
7 wider circumference; didn't it?
8 A. That's correct. There were several styles.
9 Q. Can you direct your attention to Exhibits 15839
10 to 15843, which is the wider-circumference Camel ads.
11 And that will be in book two, sir. And I'm sorry
12 that they're in that order, but that's the way they
13 were produced.
14 A. 15839?
15 Q. Through 15843. It's the same ad --
16 A. I guess it was in the same book.
17 Q. It is in the same book, doctor.
18 A. Yes.

19 MR. CIRESI: Your Honor, if there's no
20 objection by defense counsel, we would offer that ad
21 as one exhibit, being 14785.

22 MR. WEBER: I don't have an objection to
23 the renumbering, but I do have an objection on
24 entering ads with this witness on marketing and
25 advertising. It's far beyond the scope that was

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10537

1 permitted on direct.
2 MR. CIRESI: It's just a predicate for the
3 next line of questions.
4 MR. WEBER: I don't --
5 The ads, Your Honor? I don't see how they can
6 be a predicate.
7 THE COURT: Well let's find out what the
8 predicate is. I'll allow it into evidence.
9 BY MR. CIRESI:
10 Q. Now sir, that is the Camel ad for the wide
11 cigarette; correct?
12 A. Are you talking about these three exhibits
13 together?
14 Q. It's all one exhibit, but if you go to that in
15 your book, which is 15482, you'll see that portion of
16 it.
17 A. 482. Exhibit 482 --
18 Q. 15842.
19 A. I'm sorry, 15842?
20 Q. Yes.
21 A. That particular advertisement appears to be for
22 Camel Wides.
23 Q. Okay. And that was part of the Joe Camel

24 campaign; isn't that correct?

25 A. That's correct.

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953

CROSS-EXAMINATION - DAVID E. TOWNSEND

10538

1 Q. Now you would agree that the wider the
2 circumference, the greater the mutagenicity of a
3 cigarette; correct?

4 A. In a general sense?

5 Q. Yes.

6 A. I've seen some data that suggest that going to
7 very small circumference reduces the mutagenicity,
8 the Ames mutagenicity to a degree.

9 Q. So if it's wider, it's got greater mutagenicity
10 under the Ames test; correct?

11 A. If you're speaking to this Camel Wide product,
12 we tested this product for Ames mutagenicity and
13 found no statistically significant difference at a
14 circumference of 27.5 compared to the standard
15 circumference of twenty -- 24.8.

16 Q. "No statistically significant." What confidence
17 levels did you use?

18 A. At least 95, sir.

19 Q. So it was 95 percent; is that right?

20 A. That's correct.

21 Q. That doesn't mean that there isn't greater
22 mutagenicity; does it? If you know.

23 A. Well it --

24 What it means is that there's only a five
25 percent chance of -- of -- of -- of being wrong.

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953

CROSS-EXAMINATION - DAVID E. TOWNSEND

10539

1 Q. Did you conduct that --

2 A. That's a layman's -- I'm sorry. That's a --
3 That's a qualitative approach to the use of
4 confidence levels.

5 Q. Did you conduct that test?

6 A. No, I didn't. Experts in our R&D lab -- R&D
7 department did, who were experts in the area.

8 Q. Can you direct your attention to Exhibit 11715.

9 While you're looking for that, doctor, does
10 Reynolds still market the wide Camel?

11 A. Yes, they do.

12 Q. Do you have it, sir?

13 A. I am at 11715.

14 Q. And this is a Philip Morris document?

15 MR. CIRESI: We would offer it, Your Honor.

16 MR. WEBER: We'd object, Your Honor, on
17 authenticity grounds. I don't think there's an
18 author on this, and I --

19 MR. CIRESI: There's been no objection to
20 foundation on this document.

21 THE COURT: Has there been an objection on
22 foundation?

23 MR. WEBER: Well again, I'm working with
24 Philip Morris counsel on this. It does say
25 authenticity on it, Your Honor. I did not go back

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953

CROSS-EXAMINATION - DAVID E. TOWNSEND

1 and recheck.

2 THE COURT: Let me ask the question again.
3 Maybe you better recheck. I'd like to know.

4 (Discussion among Mr. Weber, Mr. Sipkins
5 and Mr. Bleakley.)

6 MR. WEBER: I'm advised by Philip Morris
7 counsel they don't know what it is, but they don't
8 have their record with them as to whether they
9 preserved that.

10 THE COURT: All right. It will be received
11 into evidence.

12 BY MR. CIRESI:

13 Q. The title of this is "Mutagenicity of Mainstream
14 Smoke Condensate of the Research Cigarettes 'WIDE';"
15 correct?

16 A. That's what it says.

17 Q. And if you go to the first page after the title
18 page, there's an objective there; correct?

19 A. Yes.

20 Q. And that's "to determine the influence of
21 cigarette circumference on the mutagenicity of
22 mainstream smoke condensate?"

23 A. That's correct. That's what it says.

24 Q. And sir, if you go to the summary page, which
25 bears the last four Bates numbers 0815 -- can you go

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953

CROSS-EXAMINATION - DAVID E. TOWNSEND

10541

1 to that?

2 A. Okay.

3 Q. And there you find the summary is that "The
4 mutagenicity of mainstream smoke condensate strongly
5 increases with the increasing cigarette
6 circumference;" correct?

7 A. It says that under "Summary."

8 Q. And the working hypothesis to explain that was
9 that "The increase in mutagenicity may be caused by a
10 decrease of the peak temperature in the burning
11 cone." Correct?

12 A. That appears to be the hypothesis or the theory.

13 Q. And you've described what the burning cone was
14 during your direct testimony; did you not?

15 A. Well I had a very brief discussion of the
16 burning cigarette and some of the processes that
17 occur in the burning cigarette.

18 Q. And you've mentioned the burning cone; correct?

19 A. I did mention the burning cone or what we call
20 the fire cone.

21 Q. Okay. And can you direct your attention now to
22 Exhibit 11988, which is a B.A.T. Company document.
23 This is a document dated February 25th, 1987;
24 correct?

25 A. February 25, 1987.

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953

CROSS-EXAMINATION - DAVID E. TOWNSEND

10542

1 Q. You've seen this before; have you not?

2 A. Because you produced it or -- yeah, produced it
3 for my cross-examination.

4 Q. Is this the document you had reference to just

5 previously talking about circumference reduction?
6 A. No, the -- the document I had in mind when I
7 made that comment about circumference reduction was
8 in fact the last document that we looked at, the one
9 that you said was from Philip Morris, which showed a
10 decline in Ames mutagenicity going to small
11 circumference, but showed actually essentially the
12 same Ames mutagenicity on two strains for the
13 conventional circumference of 24.8 and the wide
14 circumference of -- of 27.5 millimeters.

15 Q. This -- this was not the document you had in
16 mind; is that correct?

17 A. I think I just said that the document --

18 Q. That was the question.

19 A. The document I had in mind was the previous
20 document we looked at that you attributed to Philip
21 Morris.

22 Q. Thank you.

23 MR. CIRESI: Now Your Honor, we'd offer
24 Exhibit 11988.

25 MR. WEBER: No objection, Your Honor.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10543

1 THE COURT: Court will receive 11988.

2 BY MR. CIRESI:

3 Q. Now this is a document of BATCo that relates to
4 Ames testing on circumference of cigarettes; correct?

5 A. Actually the title says "Effect of circumference
6 reduction on biological activity, Meeting 20th
7 February, 1987."

8 Q. And if I could just direct your attention to the
9 very first paragraph, it states, "Circumference
10 reduction has given reduced PMWNF" --

11 Do you know what that is?

12 A. Yes, I do.

13 Q. That's Particulate Matter Water and Nicotine
14 Free?

15 A. That's correct.

16 Q. Okay. "Circumference reduction has given
17 reduced PMWNF or condensate specific activity as
18 measured by three biological tests, Ames, mouse skin
19 painting and enzyme induction;" correct?

20 A. That's what it says.

21 Q. So that based on those three tests, the smaller
22 the circumference, the less the specific activity;
23 correct?

24 A. This -- this is a general statement that says
25 that lower circumference or circumference reduction

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10544

1 has resulted in those differences. What we don't
2 know from this document or what I don't know from
3 this document is the magnitude of the
4 circumference -- circumference reduction that exerts
5 that effect.

6 Q. When you have expanded tobacco, you have an air-
7 dilution increase; do you not?

8 A. When you use expanded tobacco --

9 Q. Yes.

10 A. -- you increase air dilution?
11 Q. Yes.
12 A. Only if the pressure drop or the resistance to
13 air flow through the cigarette or through the tobacco
14 rod increases as a result of increased expanded
15 tobacco. If the pressure drop is maintained the
16 same, then air dilution doesn't change.
17 Q. Can you direct your attention to Exhibit 13086.
18 It's a Reynolds document, sir?
19 I'm sorry, I thought you had it.
20 A. Beg your pardon?
21 Q. I thought you had it. Do you have the document?
22 A. I have the document --
23 Q. Oh.
24 A. -- in front of me. I'm looking through it.
25 Q. That is a Reynolds document?

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10545

1 A. Yes.
2 Q. And it's to M. D. Shannon from R. L. Blakley
3 dated November 7th, 1990?
4 A. That's correct.
5 Q. And do you know those individuals?
6 A. Yes, I do.
7 Q. Are they in the research department at Reynolds?
8 A. Dr. Blakley is presently in the research and
9 development department. Mr. Shannon has left the
10 research department; he took early retirement.
11 Q. And Dr. Blakley, what is his academic
12 background?
13 A. He's a chemist.
14 Q. Okay.

15 MR. CIRESI: Your Honor, we'd offer Exhibit
16 13086.

17 MR. WEBER: No objection, Your Honor.

18 THE COURT: Court will receive 13086.

19 BY MR. CIRESI:

20 Q. Now the objective of this document was to
21 develop an understanding of the reasons why increases
22 in air dilution increased TA98 specific Ames
23 activity; correct?

24 A. That's correct.

25 Q. And that's by the Ames test, the TA98; correct?

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10546

1 A. TA98 refers to one particular version of the
2 Ames test, that's correct.
3 Q. And in the introduction there's a reference to a
4 paper that was published by Rice and co-workers
5 showing an increase in specific TA98 activity as air
6 dilution is increased; correct?
7 A. That's correct. And that was also recognized in
8 the NCI TWG effort.
9 Q. And if you direct your attention, sir, to the
10 last -- not the last page, but the page which states
11 the conclusions, which bears the signature of Dr.
12 Bakely -- Blakely, and that has the Bates number
13 2448. Do you see that?
14 A. Yes, I do.

15 Q. And the conclusions are there; correct?
16 A. There's a section called "CONCLUSIONS."
17 Q. And this is based on the tests that were
18 conducted by Dr. Blakley; correct?
19 A. These are Dr. Blakley's conclusions based on his
20 analysis of the situation.
21 Q. And his conclusions are "Air dilution increases
22 TA98 specific Ames activity because:
23 "1) LESS CIGARETTE ROD IS CONSUMED PER PUFF and
24 therefore we are 2) CONCENTRATING THE CONDENSATE OF
25 HIGHLY -- OF HIGH BIOLOGICALLY ACTIVE HEAT TREATED
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10547

1 TOBACCO. We also have 3) LESS ENERGY FOR COMBUSTION,
2 PYROLYSIS, AND DISTILLATION AND THEREFORE, THE
3 CHEMICAL COMPOSITION OF THE SMOKE CHANGES and we have
4 4) OPTIMIZED THE AEROSOL TRANSPORT MECHANISM FOR THE
5 HIGH BOILING POINT COMPOUNDS FROM THE HEAT TREATED
6 TOBACCO and lastly we have a LOSS OF INNOCUOUS
7 DILUENTS ON THE CAMBRIDGE PAD." Right?
8 A. That's what it says here. I certainly don't
9 agree that these are definitive conclusions based on
10 Dr. Blakley's work.
11 Q. You just don't agree with it; correct?
12 A. Well it goes more than that. At the time he was
13 doing this research he speculated that those were
14 reasonable conclusions based on his work. We had an
15 off-site conference of scientists trying to in fact
16 examine exactly this question about why TA98 --
17 MR. CIRESI: Your Honor, I'm going to --
18 I'm going to move to strike this part. It's
19 non-responsive. The question was very simple.
20 THE COURT: The outside conference is
21 non-responsive.
22 BY MR. CIRESI:
23 Q. Now sir, can you direct your attention to
24 Exhibit 3 -- or I'm sorry, 13176.
25 A. I'm there.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10548

1 Q. Do you have it?
2 A. Yes.
3 Q. It's another RJR document; correct?
4 A. I believe so, yes.
5 MR. CIRESI: Your Honor, we'd offer
6 Exhibit 1 --
7 I think it's in. It is in, 13176.
8 BY MR. CIRESI:
9 Q. Now the first page says "GENERAL
10 "Higher tar cigarettes tend to have lower AMES
11 activity on a rev/mg." --
12 And what does that mean, sir?
13 A. Revertens per milligrams. It's a measure of
14 mutagenicity.
15 Q. -- "basis than lower tar cigarettes;" correct?
16 A. That's what it says.
17 Q. And if you go to the next page, at the top under
18 "CONFIGURATION" --
19 A. Uh-huh.

20 Q. -- it says if you increase filtration, you
21 increase Ames; correct?
22 A. That's what it says, and that is consistent with
23 the NCI work.
24 Q. And if you increase air dilution, you increase
25 the Ames test; correct?

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10549

1 A. That's what it says, and that is consistent with
2 the NCI work as well.
3 Q. I didn't -- I didn't ask anything about NCI,
4 sir. Did you hear me ask that?
5 A. No, sir.
6 Q. Thank you.
7 Now if you go on to the next page,
8 "TOBACCO/FILLER RELATED." Do you see that?
9 A. Yes.
10 Q. And it says ammoniation increases Ames activity;
11 correct?
12 A. In the middle of the page it says "Ammoniation,
13 up arrow, increases activity (depending upon residual
14 ammonia)."
15 Q. Now if you can direct your attention to Exhibit
16 13083, this is another RJR document; correct?
17 A. That's correct.
18 Q. It's again from Dr. Blakley; correct?
19 A. That's right.
20 Q. And this is in January of 1993; correct?
21 A. That's right.
22 Q. And it's to Dr. Carl Ehmann. Is that how it's
23 pronounced?
24 A. Ehmann.
25 Q. Ehmann. And what was Dr. Ehmann's position in

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10550

1 1993?
2 A. He was in charge of the research and development
3 department at R. J. Reynolds Tobacco Company.
4 Q. What does he do today?
5 A. He's now working for another company.
6 Q. Which company?
7 A. It's a company in England. I forget the name.
8 Q. In this paper Dr. Blakley is again talking about
9 biological reduction in cigarettes; correct?
10 A. In a general -- in a general sense, that's
11 correct.
12 Q. And in the second full paragraph, the third
13 sentence, he states as follows: "Firstly our main
14 concern in biological reduction in cigarettes should
15 not merely be tar reduction, especially since
16 conventional ways to reduce tar (filter ventilation,
17 filtration, et cetera) actually increase the specific
18 (rev/mg) TA98 activity." Correct?
19 A. That's what it says.
20 Q. And the conventional ways to reduce are the ones
21 that you mentioned in your direct testimony when you
22 talked about reducing tar; correct?
23 A. Conventional ways of tar reduction were many of
24 those that I have talked about in my direct

25 testimony.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10551

1 Q. That -- those are --
2 A. Here --
3 Q. Those are the ones you mentioned; correct?
4 A. I mentioned conventional ways in my direct
5 testimony.
6 Q. One was expanded tobacco; correct?
7 A. That's correct.
8 Q. One was ventilation?
9 A. Absolutely right.
10 Q. One was filtration?
11 A. Of course.
12 Q. Now Dr. Blakley goes on to state, "If we are
13 able to keep the mucociliary transport system working
14 the tar can be moved out of the lungs and thus
15 eliminate many of the problems with the tar; however,
16 the tar cannot be ignored, because if we make it
17 extremely mutagenic, then even with reduced residence
18 time in the lung it could do much damage." Correct?
19 A. That's what it says.
20 Q. How long did Dr. Blakley work as a chemist in
21 this area, sir?
22 A. In this area?
23 Q. Yes.
24 A. Dr. Blakley, as I recall, joined Reynolds in
25 maybe 1986 or thereabouts. He's -- he worked in an

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10552

1 exploratory area, got into this and worked in this
2 area for maybe a year, I would say.
3 Q. And if you look at the last paragraph on the
4 first page there, he says that "Lastly, understanding
5 how chemistry is occurring in the cigarette allows a
6 chemist product developer to have a better
7 understanding of how to manipulate the cigarette
8 smoke chemistry." Correct?
9 A. That's what it says.
10 Q. And he goes on to state that it's fundamental
11 work to develop a knowledge base; correct?
12 A. That's what he says.
13 Q. And that that was important because it would
14 give an understanding of the formation of free
15 radicals; correct?
16 A. In a general sense, that's correct. You left
17 some words out, but --
18 Q. Do you know what free radicals are?
19 A. Yes.
20 Q. What are they, sir?
21 A. They're a highly reactive species that contain
22 unpaired electrons.
23 Q. And by "highly reactive," do you know what the
24 effect of that is from a biological standpoint?
25 A. Well I think that's the point of -- of a lot of

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10553

1 current biological research, to try to understand the
2 effects of free -- free radicals in biological
3 systems. I think scientists are pursuing that
4 diligently as we speak.

5 Q. It relates directly to the carcinogenic activity
6 of a product; doesn't it?

7 A. I don't think that conclusion has been made. I
8 think there are a number of theories that free
9 radical -- free radical adducts of genetic material
10 might be the -- one way of initiating tumor
11 production. That's a general theory at this point.

12 Q. Can you direct your attention to Exhibit 12857.

13 Do you recall we were talking about compensation
14 and smoking machines and you were talking about the
15 fact that the FTC machine doesn't smoke like a
16 cigarette smokes; correct? Remember that?

17 A. Well I think that's a paraphrase of my
18 testimony.

19 Q. I didn't intend to repeat it word for word, sir,
20 I'm just trying to focus your attention on it. Do
21 you recall that discussion?

22 A. I recall our discussion on compensation.

23 Q. Now this is a Reynolds document dated April 2nd,
24 1987; correct?

25 A. That's correct.

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953

CROSS-EXAMINATION - DAVID E. TOWNSEND

10554

1 Q. And it's from A. B. Norman and G. M. Reynolds;
2 correct?

3 A. No, that's not correct.

4 Q. Excuse me, J. H. Reynolds.

5 A. That's correct.

6 Q. Is that right?

7 And who are those two individuals?

8 A. They're researchers in the -- in the research
9 and development department at Reynolds.

10 Q. And they're giving a summary of 1986 smoking
11 behavior research; correct?

12 A. That's the subject.

13 Q. And the summary was prepared at the request of
14 Mr. Christopher; correct?

15 A. It says, "The attached summary was prepared at
16 the request of Mr. Christopher...."

17 Q. Do you know who Mr. Christopher is?

18 A. Yes.

19 Q. And who was he, sir?

20 A. He was an executive in R. J. Reynolds Tobacco
21 Company.

22 Q. What was his position?

23 A. He was in charge of research and development,
24 among other things.

25 Q. And if we go on to the next page there, we find

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953

CROSS-EXAMINATION - DAVID E. TOWNSEND

10555

1 the memorandum to Mr. Christopher from A. B. Norman
2 and J. H. Reynolds; correct?

3 A. That's right.

4 Q. And the summary is the major findings from the
5 study of smoking behavior of Marlboro and Winston

6 smokers; correct?
7 A. That's what it says.
8 Q. Can you go to the first page of the summary of
9 findings.
10 A. Okay, I'm there.
11 Q. And we have puff profile results there and smoke
12 delivery replication results; correct?
13 A. Those are two categories.
14 Q. Let's take a look at the puff profile results
15 first. In this summary do Mr. -- of Mr. Reynolds and
16 Norman to Mr. Christopher, it is referenced that "For
17 the panel as a whole, puff volume, frequency of
18 puffing and number of puffs taken increased with
19 decreasing FTC 'tar' delivery of the test
20 cigarettes;" correct?
21 A. That's what it says here, that's correct.
22 Q. And those are the Marlboro and Winstons;
23 correct?
24 A. I don't see it saying that explicitly. It says
25 in the cover page Marlboro and Winston smokers.

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953

CROSS-EXAMINATION - DAVID E. TOWNSEND

10556

1 Q. Well if you'd look at the next bullet point,
2 you'll see "On average, Marlboro smokers took fewer
3 puffs of larger volume and puffed less frequently
4 than WINSTON smokers, regardless of the cigarette
5 tested." Do you see that?
6 A. This refers to Marlboro smokers and Winston
7 smokers. I thought your question was referring to
8 Marlboro and Winston cigarettes.
9 Q. Do you know if they were smoking Marlboro and
10 Winston cigarettes in this test?
11 A. If this test is -- is what I recall it to be, I
12 think it was a switching study to examine switching
13 behavior, if it's what I recall it to be, and they
14 were switched to other than their usual brand.
15 Q. And they did, and looked at the smoke delivery
16 replication results; didn't they?
17 A. That was a part of the study, actually, to take
18 the puff profile behavior and try to estimate the
19 delivery in -- or the yield of tar and nicotine under
20 those puffing parameters.
21 Q. And they used a human mimic smoking machine;
22 didn't they?
23 A. Yes.
24 Q. That's the HMSM; correct?
25 A. That's what we call it internally. In fact it's

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953

CROSS-EXAMINATION - DAVID E. TOWNSEND

10557

1 a computer-driven smoking machine to replicate --
2 that replicates the puff profile and the puffing
3 behavior that we measure with humans.
4 Q. That's not the FTC method; is it, sir?
5 A. No, of course not. We've already described the
6 FTC method.
7 Q. And what it states here is that "'Tar'
8 deliveries measured with the human-mimic smoking
9 machine were increased relative to the standard FTC
10 method by 22 percent for full flavor products, 67

11 percent for full flavor light tar products and by 400
12 percent for the ultralight tar product;" correct?
13 A. That's what it says. And as you could expect,
14 you'd get a larger percentage increase for lower
15 absolute tar levels but still have lower overall
16 yields.
17 Q. Doesn't say that there; does it, sir?
18 A. I'm using my common sense here.
19 Q. "Nicotine deliveries were also greater than FTC
20 values but the increases were not as large as for
21 'tar'. Puffing behavior changes altered the nicotine
22 concentration (T/N ratio) in the smoke;" correct?
23 A. It says "Puffing behavior changes altered the
24 nicotine concentration," or tar-to-nicotine ratio,
25 "in the smoke."

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10558

1 Q. So here we're seeing a compensation from 22 to
2 400 percent; aren't we, sir?
3 A. I don't -- I don't think that's a correct way to
4 look at these data. I think that's entirely
5 misleading.
6 Q. That's what's reported in this memorandum, that
7 for ultralight tar products there was a 400 percent
8 increase; correct?
9 A. That's exactly what it says here. And if one
10 takes a typical ultralight product, like a one
11 milligram, a 400 percent increase would now be four
12 milligrams, compared to 15 plus for full flavor --
13 full flavor products.
14 Q. And as you --
15 A. So it's still extremely low percentage-wise.
16 And this is the point I was trying to make earlier,
17 percentage-wise, the percentage can be a large number
18 but still reflect a relatively small increase in
19 absolute numbers.
20 Q. How many more cigarettes were smoked by these
21 smokers?
22 A. I don't know.
23 Q. They smoked more; didn't they?
24 A. I don't know that.
25 Q. And if they smoked more, they'd get more tar;

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10559

1 wouldn't they, sir?
2 A. Well I think common sense says if one smokes
3 more cigarettes, one would get more tar.
4 This was a switching study. I don't understand
5 it to be a long-term use study. But it was rather
6 intended, I believe, to examine changes in people's
7 puffing behavior if they're switched from a high tar
8 to a ULT or to a low tar product.
9 Q. And most of the cigarettes smoked today are low
10 tar cigarettes; are they not?
11 A. The largest category in the U.S. market is low
12 tar cigarettes.
13 Q. Which means, according to the research that
14 you're aware of, that millions upon millions of
15 smokers have switched from high tar to low tar.

16 A. I think that's a fair assumption.
17 Q. Now do you recall the exhibits that you used to
18 show some pH averages that you said you looked at? I
19 believe they were Exhibits 3021, 3017, 3027A and
20 3001.

21 These were your own exhibits, sir. They would
22 not be in our books.

23 A. You want me to find them in here?

24 Q. Yes. I don't have the tab for them, but I can
25 give you one exhibit number, we can use that, X3017.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10560

1 A. Can somebody refer me to a tab number, please?
2 MR. CIRESI: I will. I will get one from
3 your counsel.

4 THE WITNESS: Thank you.

5 MR. CIRESI: We'll put it up on the --
6 X3017, if we could have the overhead for that.

7 (Discussion off the record.)

8 BY MR. CIRESI:

9 Q. Now you said that you went back and looked at
10 this after some pretty serious flap. Do you remember
11 that?

12 A. Pretty -- pretty lose word, "flap."

13 Q. Pardon me?

14 A. I remember saying that.

15 Q. And this was some time in 1994; was it not, sir?

16 A. I think this -- this flap, as I referred to it,
17 certainly began in 1984 when -- I mean 1994, sorry,
18 when FDA and others had criticized the industry for
19 manipulating pH and manipulating nicotine. It caused
20 certain concern, a lot of concern for myself and my
21 staff, because we knew we hadn't manipulated nicotine
22 and pH, --

23 Q. Excuse me.

24 A. -- and so --

25 Q. Once again, I just asked if it began in 1994.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10561

1 That was my question. Did it?

2 A. My staff and my concern began in 1994 because of
3 the allegations against us on pH manipulation.

4 Q. The FDA was looking at the industry and at RJR;
5 wasn't it?

6 A. The FDA among others was.

7 Q. Representative Waxman had his hearings at that
8 time; correct?

9 A. That's correct.

10 Q. The documents, internal documents of the
11 industry were coming out at that time; correct?

12 MR. WEBER: Objection. We've been through
13 this before. It's argumentative, Your Honor.

14 THE COURT: It's not argumentative. You
15 may answer.

16 Q. Isn't that right, sir?

17 A. I think some documents from various tobacco
18 companies were becoming public.

19 Q. And the FDA was looking to regulate and then did
20 in fact move to regulate the industry as a drug;

21 correct?
22 A. It's clear to me that the FDA wanted to regulate
23 this industry and regulate cigarettes as a
24 drug-delivery device.
25 Q. Okay. And then at that time someone within
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10562

1 Reynolds asked for a legal and regulatory response;
2 isn't that right?
3 A. A legal and regulatory response on what, sir?
4 Q. On this issue of pH.
5 A. A legal and regulatory response?
6 Q. Yes.
7 A. For what purpose?
8 Q. For the purpose of responding. A legal and
9 regulatory response. Isn't that --
10 A. For responding to what?
11 Q. For responding to the pH manipulation charges.
12 A. I'm not entirely sure of what you're referring
13 to, but let me tell you what happened --
14 Q. Well if you don't know, just tell me you don't
15 know.
16 A. It's not a matter of don't know. I know exactly
17 what happened.
18 Q. Was a --
19 A. But that's a very broad general question.
20 Q. All I want to know is was a legal and regulatory
21 response requested by someone within Reynolds? If
22 you don't know, tell me you don't know.
23 A. I'm telling you I know what happened at
24 Reynolds.
25 Q. Do you know if a legal and regulatory response
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10563

1 was asked for?
2 A. That is a very general question. I can tell you
3 that there was a response prepared for the FDA. Part
4 of that response in 1994 or early 1995 included a
5 discussion of pH. That's one response to the FDA.
6 Q. Thank you.
7 Now when you looked at this pH, you did know
8 that if you increase pH, you increase free nicotine;
9 don't you?
10 A. I think theoretically that's quite reasonable.
11 If one adds enough base to increase pH enough,
12 theoretically one would expect more free nicotine. I
13 think that's a reasonable assumption.
14 Q. And sir, you don't know how much free nicotine
15 is contained in smoke with a pH of 6.3; do you?
16 A. There is no way to directly measure free
17 nicotine that I'm aware of. I think many people have
18 tried to calculate the expected amount of free
19 nicotine based on an equation, the Henderson
20 Haselbach equation, which is -- which is valid for
21 dilute aqueous solutions.
22 Q. Sir, the Henderson Haselbach equation doesn't
23 measure free nicotine in the vapor; does it?
24 A. That's precisely my point. It's a calculated
25 number. I'm not aware of a direct measure of free

10564

1 nicotine that exists.
2 Q. Now you don't know, then, how much free
3 nicotine --
4 You don't know how much free nicotine is
5 contained in smoke with a pH of 6.3, do you?
6 A. Again, I'm not aware of any analytical method
7 that measures directly the amount of free nicotine in
8 smoke. I do know that some scientists have -- have
9 estimated that using the Henderson Haselbach
10 equation.
11 Q. Can you direct your attention to your
12 deposition. It was taken on October 2nd, 1997.
13 Should be on your right. Let me hand one up --
14 Do you have it, professor? Do you have it,
15 doctor?
16 A. I think this is it.
17 Q. Okay. Can you go to volume two, page 371.
18 A. Okay.
19 Q. Now if you look at line 14, the question is
20 asked: "Now as the pH of smoke rises, the amount of
21 free nicotine in the smoke will also rise; correct?
22 "Answer: Theoretically that makes sense.
23 "Question: How much free nicotine is contained
24 in the cigarette smoke with a pH of 6.3?
25 "Answer: Again I don't know.

10565

1 "Question: How much free nicotine is contained
2 in the smoke of a cigarette with a pH of 6.8?
3 "Answer: Again, I don't know."
4 Now did you give those answers to those
5 questions at that time?
6 A. Yes, sir, I did.
7 MR. WEBER: Your Honor -- Your Honor, I'd
8 object under the rule of completeness and ask for the
9 next few questions and answers to be read as well.
10 Otherwise I think it's an inappropriate use of the
11 deposition.
12 MR. CIRESI: The next two you want?
13 MR. WEBER: Well the next one certainly.
14 BY MR. CIRESI:
15 Q. "Question: You can't calculate that number
16 either.
17 "Answer: Again using basic principles of
18 chemistry, one could calculate an expected fraction
19 of free nicotine versus protonated nicotine as a
20 function of pH.
21 "Question: Okay."
22 Did you give that answer to that question?
23 A. Yes, sir, I did.
24 Q. Now you don't know how much free nicotine is
25 contained in cigarette smoke that has a pH of 5.9, do

10566

1 you?

2 A. Once again, I don't -- I'm not aware of an
3 analytical method to directly measure free nicotine.
4 I know some scientists have calculated or tried to
5 estimate the amount of free nicotine expected using
6 the Henderson Haselbach equation.
7 Q. Well the Henderson Haselbach equation cannot be
8 used to calculate free nicotine in the vapor phase;
9 can it, sir?
10 A. I think the Henderson --
11 My recollection is that the Henderson Haselbach
12 equation is valid for dilute aqueous solutions.
13 Q. It is valid for the particle, the liquid
14 particle; correct?
15 A. I beg your pardon?
16 Q. It is valid for measuring the pH in the liquid
17 particle; correct?
18 A. No, I'm not -- I'm not sure I would agree with
19 that. I think -- I think it's valid for dilute
20 aqueous solutions, and the particles in cigarette
21 smoke is -- is really not predominantly aqueous.
22 Q. Well, are you saying that if you do a test where
23 you get the vapor and the particulate into an aqueous
24 solution, you could then measure the pH? Is that
25 what you're saying?

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10567

1 A. I think --
2 Well that's not exactly what I'm saying. I'm
3 saying that scientists have tried to estimate the
4 amount of free nicotine from the Henderson Haselbach
5 equation, which is based on a dilute aqueous
6 solution.
7 Q. That's not what Mr. Morie did in the document
8 that you showed the jury; is it?
9 A. Well I think that's not what a number of
10 scientists have done. They've taken the Henderson
11 Haselbach equation and tried to estimate the amount
12 of free nicotine.
13 Q. But we'll get --
14 A. Is that a reasonable comparison? I don't know.
15 Q. Okay. You --
16 A. There's also an analytical method by which
17 people collect smoke in a water trap, stick a pH
18 electrode in and read a number. That is a number
19 that is -- is actually the type of data that we
20 reported. And Morie, Dr. Morie from Tennessee
21 Eastman, and others have reported the same kind of
22 data.
23 Q. We're going to get to the Morie article and see
24 what he did.
25 A. Okay.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10568

1 Q. He measured total particulate matter; didn't he?
2 A. I don't recall. We'd have to go back to the
3 document.
4 Q. You don't remember what was in that document
5 that you testified to?
6 A. I remember a number of things in that document.

7 To answer your question accurately, I'd want to go
8 back and see the document.
9 Q. Now when you did this analysis and you went back
10 and averaged the pH --
11 Let's just take one point there.
12 A. Are we changing documents again?
13 Q. Yes. We're back to your Exhibit 3017.
14 A. Okay.
15 Q. First of all, RJR didn't routinely measure pH;
16 correct?
17 A. RJR has never routinely measured pH as a -- as a
18 specification of our commercial products or to
19 support manufacturing of cigarettes. It's not a
20 routine measure in that sense.
21 Q. Sir --
22 A. It's been measured from time to time in -- in
23 research and development. No question about it.
24 Q. And you know from available data that you've
25 seen that in your present cigarettes, your pH is

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10569

1 between six and 6.4.
2 A. Present commercial cigarettes are generally in
3 that range between, I would say, 5.9 to 6.3, maybe
4 6.4 at the most.
5 Q. Okay. Now when we go back to Exhibit 3017, take
6 the first point, which is over 6.6. Do you see it up
7 there?
8 A. I see that point.
9 Q. How many measurements were taken to get that
10 average?
11 A. These data come from our competitive brands
12 analysis data bank, database, and in the course of
13 doing that we make pH measurements of competitive
14 products versus some of our products every few
15 months. So there'll be typically, say, four or six,
16 maybe even as many as eight points averaged into each
17 data point.
18 Q. Four to eight points in each data point; is that
19 what you're saying?
20 A. In a general sense.
21 Q. Do you know that?
22 A. Do I know that?
23 Q. Yes.
24 A. Well I know that comes from our -- our
25 competitive brands database. I've looked at the

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10570

1 data, and I know that those data for each year was
2 averaged by my staff to result in these data points.
3 Q. Did you go back and look at each measurement
4 that was averaged?
5 A. Sir, I don't --
6 Q. Did you?
7 A. Sir, you asked me this question three days ago,
8 and my answer still is, because it's the correct one,
9 is I went back and looked at some of the data. My
10 staff accumulated all this -- these data. They gave
11 me the results. I went through and looked through

12 some of the data to convince myself that the analysis
13 was -- was approached in a correct way and that the
14 conclusions were correct.
15 Q. That wasn't my question, sir. See, I'm trying
16 to get at --
17 A. I'm sorry, I'm sorry, I thought it was, sir.
18 Q. Let me see if you can understand. I'm trying to
19 get at whether or not whatever conclusion you have is
20 correct, so I want to know what you did.
21 A. I just --
22 Q. I asked you: For the point above 6.6, did you
23 look at every measurement of every test? "Yes" or
24 "no."
25 A. Did I look at every measurement of every test in
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10571

1 the competitive brands data book, is that your
2 question?
3 Q. From wherever this average of over 6.6 came
4 from. That's my question.
5 A. I don't --
6 Q. Did you?
7 A. I don't remember whether I looked at that
8 specific point for that particular year for this
9 particular brand style or not.
10 Q. All right.
11 A. I'm telling you that I went back and looked at
12 some data to ensure to myself that my staff had done
13 this -- this analysis correctly.
14 Q. Doctor, I'm just trying to find out what you
15 did.
16 A. And I'm just trying to tell you what I did.
17 Q. Now --
18 Yes. And I'm not interested now in what you --
19 conclusion you may draw from what you did, I simply
20 want to know what you did.
21 A. And I --
22 Q. Do you understand that?
23 A. Sir, I --
24 MR. WEBER: Let me object to counsel's
25 commentary, counsel. The question was answered. He
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10572

1 told him he just didn't remember on this one. The
2 question has been answered.
3 THE COURT: Well I'm not sure the question
4 has been answered. You may answer it.
5 BY MR. CIRESI:
6 Q. Sir, again --
7 THE COURT: Counsel, do take care of the
8 commentary, please.
9 MR. CIRESI: I will, Your Honor.
10 Q. Again, doctor, if you don't understand a
11 question that I ask you, please tell me. Is that
12 agreeable?
13 A. Sir, I think I understand.
14 Q. All right.
15 A. And if I'm misunderstanding you, I'm sure you'll
16 tell me.

17 Q. Well I don't want to engage in commentary, so
18 you let me know.

19 The first data point, you do not know how many
20 tests were conducted for that; do you, of your own
21 personal knowledge?

22 A. Of this one particular data point.

23 Q. Yes.

24 A. That particular data point, I don't remember
25 whether I went back and looked at it or not.

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953

CROSS-EXAMINATION - DAVID E. TOWNSEND

10573

1 Q. In fact, for every one of the data points, you
2 cannot testify whether you actually went back and
3 looked at every test for the data point; do you?

4 A. The data are accumulated by year. I select -- I
5 selected a number to ensure myself that my staff did
6 this correctly.

7 Q. That's not what I asked.

8 A. I can't testify as I sit here that I looked at
9 any one of these points in particular.

10 Q. You can't testify to that. All right. So you
11 don't know for any individual data point how many
12 tests were conducted for that individual data point;
13 do you?

14 A. I just told you in a general sense a few minutes
15 ago that there were a number of measurements taken
16 throughout the year as a function of month.

17 Q. Sir, that wasn't my question. My question was:
18 For any one of the data points, you cannot tell us
19 what number of tests were used to arrive at whatever
20 average it is for that data point; can you?

21 A. If you point to a specific point on one of these
22 graphs, I cannot tell you exactly and accurately how
23 many data points are comprised by that average for a
24 given point.

25 Q. Okay. Now do you know for any test for any data

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953

CROSS-EXAMINATION - DAVID E. TOWNSEND

10574

1 point what specific measurement was taken?

2 A. I'm not sure I understand your question.

3 Q. What type of pH measurement was taken for any
4 data point in any test represented within that data
5 point, what type of test?

6 A. What test method?

7 Q. Yes.

8 A. I'm aware that at Reynolds we've had three
9 different test methods over the years. They've been
10 different in a number of respects. We've compared
11 the data across those test methods and believe that
12 this is a fair and accurate representation of that
13 comparison.

14 Q. I'm just trying to get at what you did again,
15 doctor. You keep wanting to give us a conclusion,
16 and I'm simply asking you what do you know.

17 MR. WEBER: Object to the commentary, Your
18 Honor.

19 MR. CIRESI: Well --

20 THE COURT: Well it is non-responsive to
21 the question. The question should be answered.

22 Q. You don't know what type of test was done on any
23 one of however many tests were conducted on any data
24 point; do you?

25 A. I don't think that's a fair conclusion. The
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10575

1 test method that we've use predominantly --
2 If you want to know the test method, the test
3 method that we've used predominantly involves using
4 a smoking machine and taking the whole smoke, not
5 filter, but the gas phase and the particulate phase
6 into what we call a water impinger trap. The -- the
7 whole smoke goes down the tube, actually bubbles out
8 into this trap. There's mass transfer to the water.
9 We've done backup test studies to ensure that we're
10 trapping virtually all of the smoke in this water
11 bottle.

12 Once the solution is collected, we then transfer
13 it to a -- to another -- to a small beaker where we
14 then measure the pH using a calibrated standardized
15 pH electrode.

16 Q. I'm going to ask my question again. Do you know
17 what specific test method was used for any one of the
18 tests for any one of the data points? Can you go to
19 6.6 and say we used the Sensabaugh technique or we
20 used a different technique or any specific test, can
21 you do that?

22 A. If you're asking me to point to one point and --
23 and tell you what method was used, I would be
24 uncomfortable doing that today under oath saying,
25 yes, a specific test method was used for this

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10576

1 specific point for this specific brand.

2 Q. All right.

3 A. Those data are certainly available in our --
4 in -- in our R&D library.

5 Q. What was the standard deviation about the mean
6 for each measurement of each specific test, if you
7 know?

8 A. I don't know that. I did ask my -- the -- the
9 person in charge of this analytical method --

10 Q. Excuse me. I didn't ask for hearsay. I want to
11 know what you know.

12 A. I don't know what "hearsay" means legally, but
13 I'm telling you that --

14 THE COURT: Sir, --

15 THE WITNESS: Yes, sir.

16 THE COURT: -- you're being asked to
17 testify as to what you know. You can't start quoting
18 other people that have talked to you. That is what
19 we call hearsay.

20 THE WITNESS: Yes, sir.

21 THE COURT: Okay?

22 THE WITNESS: Thank you, Your Honor. I'm
23 sorry.

24 BY MR. CIRESI:

25 Q. You yourself cannot testify as to what was the
STIREWALT & ASSOCIATES

10577

- 1 standard deviation about the mean for any measurement
2 for any data point on any one of these charts; can
3 you?
4 A. If you're referring to any specific individual
5 number that's included in here, the answer is -- as I
6 sit here right now, the answer is no.
7 Q. You don't know what the error bar was for any
8 one of the tests which are combined for any one of
9 those data points; do you?
10 A. If you're -- if you're referring to any one of
11 these specific points for any one of these specific
12 brand styles, I don't know specific error bars or
13 variance data for any one of those given points. I
14 do, however, know general variability of the test
15 method.
16 Q. And an error bar will give you the upper and
17 lower confidence level; won't it?
18 A. That's generally the way it's done, that's
19 correct.
20 Q. And there would be one of those for every single
21 test, if it was conducted properly, that went in to
22 making up the average for any data point on any one
23 of these charts; isn't that correct?
24 A. I think detailed analysis of data often use --
25 uses confidence levels or confidence limits in

STIREWALT & ASSOCIATES

10578

- 1 plotting data.
2 Q. You must --
3 A. That doesn't --
4 The absence of it doesn't mean that the
5 experiment wasn't done correctly, --
6 Q. Ah.
7 A. -- if that's what you mean.
8 Q. But there's no error bars for any of these
9 studies; is there?
10 A. The data exist that they could be generated.
11 Q. There's no error bars for any one of the tests
12 for any of the data points; is there, sir?
13 A. If you're referring to specifically on this
14 chart, there are no error bars presented on this
15 chart. The data are available where that can be
16 calculated.
17 Q. And do you know what a trend analysis is?
18 A. In a general sense, yes.
19 Q. And you need confidence levels and error bars to
20 draw any conclusion from a graph to see whether or
21 not it's valid or not; don't you, sir? From a
22 statistical standpoint, isn't that true?
23 A. To make statistical comparisons, one needs an
24 estimate of the variance about each data point, or a
25 variance of the method, and needs to know what the

STIREWALT & ASSOCIATES

10579

- 1 error is in each -- in each measurement.
2 Q. And we have none of that for these; correct?

3 A. We have not included error bars, we have not
4 done statistical calculations doing statistical T
5 tests or direct comparisons of each data point to
6 make statistical assertions. What we have done is
7 provided averages of the data so that one can
8 visually draw conclusions.
9 Q. Well one visually can't draw a statistical
10 conclusion because, based on the absence of error
11 bars, this trend could be upward, or it could be
12 downward, or it could be level, but we don't know
13 because we don't have the error bars; isn't that
14 correct, sir, from a statistical standpoint?
15 A. In a strict sense, you're correct. And I've
16 already made it clear that I know in a general sense,
17 and we have actually hard data at the laboratory that
18 we know what the variability of that method is on
19 repeated measurements of the same sample of
20 cigarettes.

21 MR. CIRESI: Move to strike the
22 non-responsive portion.

23 THE COURT: Well I'll let it stand.

24 Q. Now sir, you mentioned that there were pH's of
25 5.2 to 6.2 in the literature. Do you remember that?

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10580

1 A. Yes. Five -- I remember 5.8 to 6.2.
2 Q. And one of the documents you referred to was the
3 Morie article; correct?
4 A. We referred to Dr. Morie's article.
5 Q. And that's --
6 I believe you'll find it at tab 95. It is
7 Exhibit GK100344. That would be in your documents,
8 sir, tab 95.
9 A. Okay.
10 Q. Now this is the document that you were referring
11 to; correct?
12 A. Yes.
13 Q. And if we go to the second column, do you see
14 the equation set forth there?
15 A. Yes.
16 Q. Actually they start on the first.
17 A. Sorry?
18 Q. They start on the first column. Do you see the
19 equations, and then they carry over to the second?
20 A. Yes.
21 Q. Do you know what those are?
22 A. These are equilibrium constants.
23 Q. If you go over to the second, do you know what
24 that is?
25 A. Are you talking about the chart that's displayed

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10581

1 now?
2 Q. Right below the chart.
3 A. Right below the chart?
4 Q. Yes.
5 A. Those are approaches for FORTRAN calculations
6 that Dr. Morie did to estimate free nicotine levels.
7 You can actually do this chart.

8 Q. And that's Henderson Haselbach?
9 A. This is a generalized form of the types of
10 calculations that he used to calculate the Henderson
11 Haselbach.
12 Q. That's Henderson Haselbach; isn't it?
13 A. That's correct.
14 Well now this is the form that he used for doing
15 his computer calculations --
16 Q. Now --
17 A. -- that generated the curve that's displayed
18 here.
19 Q. Now if you go down below, right above
20 "Literature Cited," do you see the last few
21 sentences? Do you recall you read those on direct?
22 A. Yes.
23 Q. "The pH from the smoke of domestic blend
24 cigarettes range from 5.2 to 6.2 (average 5.6). It
25 is obvious from this that the percentage of

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10582

1 unprotonated nicotine" --
2 Now that's free nicotine; right?
3 A. Unprotonated nicotine refers to free nicotine.
4 Q. Okay.
5 A. Which --
6 And free nicotine can exist in the vapor phase
7 or the particulate phase.
8 Q. But here they were talking about the liquid
9 phase and not the vapor phase; weren't they?
10 A. Yes.
11 Q. Yes. That's what TPM means, total particulate
12 matter; correct?
13 A. TPM is total particulate matter.
14 Q. That's not the vapor phase; is it, sir?
15 A. TPM is certainly not the vapor phase, it's the
16 particulate phase.
17 Q. And it was in the liquid phase where they found
18 a .22 to 2.17 percent free nicotine; correct?
19 A. "It is obvious from this that the percentage of
20 unprotonated nicotine in the TPM of smoke from these
21 cigarettes is very low (.22 to 2.17 percent)."
22 That's what Dr. Morie said.
23 Q. Now as you have testified, you're -- you don't
24 hold yourself out as an expert in biology; do you?
25 A. No.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10583

1 Q. But you do know one very basic thing, and that
2 is that the free nicotine that goes across the
3 alveolar epithelial lining of the lung is in the
4 vapor phase; isn't it?
5 A. I'd say predominantly that's the case.
6 Q. Pardon me?
7 A. Predominantly that's the case.
8 Q. You're not suggesting that it can get across in
9 the liquid phase; are you?
10 A. There's mechanical capture of TPM or
11 particulates in the lung. If there's that mechanical
12 capture, if there's free nicotine in the -- in the

13 TPM, it could also transfer, I would think.
14 Q. But it has to be free nicotine to get across the
15 alveolar epithelial lining; correct?
16 A. I think that's reasonable.
17 Q. Now Mr. Morie did not attempt to calculate the
18 free nicotine in the vapor phase; did he?
19 A. No, he didn't.
20 Q. Can you direct your attention to Exhibit 13190.
21 That would be in our book, sir.
22 A. I'm sorry, sir, what was the number?
23 Q. 13190.
24 A. Okay.
25 Q. Now you'll recall that Dr. Morie had free
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10584

1 nicotine of from .22 to 2.17 in the liquid phase;
2 correct?
3 A. That's what he --
4 Q. Total particulate matter; correct?
5 A. He said in the particulate matter, that's what
6 he estimated.
7 Q. Now can you go to this Exhibit 13190. That's a
8 Brown & Williamson document; correct?
9 MR. WEBER: Your Honor, I'd object to any
10 questions on this for the reason that it was
11 designated for this examination at about 10:00
12 o'clock Tuesday night, five days beyond the date set
13 in the court order.
14 MR. CIRESI: Your Honor, we identified two
15 documents on that night, just as the defendants have
16 identified documents for us. It was still within the
17 time period before he testified on cross, and it
18 resulted as a result of his testimony. That has been
19 a common practice in this litigation throughout.
20 THE COURT: Proceed, counsel.
21 BY MR. CIRESI:
22 Q. Now, sir, did you read this document?
23 A. I glanced at it briefly.
24 Q. All right.
25 A. I haven't read the whole thing.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10585

1 MR. CIRESI: Your Honor, we'd offer Exhibit
2 13190.
3 MR. WEBER: I object for the reasons I just
4 said in violating -- per the court order.
5 THE COURT: Court will receive 13190.
6 BY MR. CIRESI:
7 Q. Now the title of this document is "EFFECTS OF
8 VARYING SMOKE pH ON KOOL;" correct?
9 A. That's correct. KS/2444 -- or 244, whatever
10 that is.
11 Q. Can you direct your attention to page three.
12 A. Okay.
13 Q. Now you'll recall in Dr. Morie's article, the pH
14 range was from 5.2 to 6.2; correct?
15 A. That's correct.
16 Q. And again, the free nicotine ran from .22 to
17 2.17 percent; correct?

18 A. I think he estimated from his calculations with
19 the Henderson Haselbach about .2 something to 2.1
20 something.
21 Q. Of the total particulate matter; correct?
22 A. Of the total -- total particulate matter.
23 Q. Now, sir, if we go to Table 2 here, do you see
24 the smoke pH across the top?
25 A. Yes.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10586

1 Q. 4.8, 5.2, 5.8; correct?
2 A. Right.
3 Q. And at 5.2 the free nicotine here is 24.7
4 percent; correct? Free nicotine percentage. Do you
5 see it?
6 A. At 5.2?
7 Q. Yes.
8 A. 24.7?
9 Q. Yes.
10 A. That doesn't make sense to me.
11 Q. Because it is measuring both the particulate
12 matter and the vapor phase; correct, sir?
13 A. The amount of --
14 The amount of free nicotine in the vapor phase
15 is determined by the vapor pressure, which is quite
16 low. I don't understand that number of 24.7.
17 Q. You've never --
18 A. I just don't understand that at all.
19 Q. You've never calculated free vapor; have you,
20 sir, you yourself?
21 A. Me myself personally?
22 Q. Yes.
23 A. No, of course not.
24 Q. Now the free nicotine percent for 4.8 is 15.2
25 percent; isn't it?

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10587

1 A. At a pH of 4.8, it says 15.2 percent. And I
2 don't understand that number, I don't understand that
3 at all.
4 Q. I know. You said that.
5 A. Yes.
6 Q. Now the free nicotine percent for 5.8 is 34.5
7 percent; correct?
8 A. That's what it says again, and I don't --
9 I would have to read this document and see if
10 they're trying to calculate this, if this is some
11 attempt to try to measure free nicotine. Again, I'm
12 not aware of -- of an analytical measure of free
13 nicotine that anyone has done.
14 Q. Do you know what --
15 A. I just don't --
16 Q. Do you know what a denudered tube is?
17 A. Of course I do.
18 Q. All right.
19 A. I know exactly an a denudered tube is, but --
20 It can measure volatile nicotine under certain
21 conditions, but I don't think it's an absolute
22 measure of free nicotine necessarily.

23 Q. But you do know what a denudered tube is.
24 A. Yes.
25 Q. That's all I asked.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10588

1 A. Absolutely.
2 Q. Okay. Now can you direct your attention to
3 Exhibit 13182. It's the one immediately preceding.
4 A. Okay, I'm there.
5 Q. This is another B&W document. This is in
6 evidence, I believe.
7 Did you review this document, sir?
8 MR. WEBER: I have the same objection to
9 this one, Your Honor, because of the Tuesday night
10 designation.
11 THE COURT: Okay. This is the second of
12 the two documents designated?
13 MR. CIRESI: That's correct.
14 THE COURT: All right. Proceed.
15 BY MR. CIRESI:
16 Q. Did you review this one, sir?
17 A. It looks familiar. I don't remember going
18 through -- through it in detail, but it does look
19 familiar.
20 Q. If you can go to the first page of it.
21 A. The first page?
22 Q. Yes.
23 A. You mean the cover page?
24 Q. Good question. The text part of it, sir, the
25 next page.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10589

1 A. Okay.
2 Q. Do you see it notes "FILE NOTE
3 "OBSERVATION OF FREE NICOTINE CHANGES IN TOBACCO
4 SMOKE/NUMBER 528?"
5 A. Sure, I see that.
6 Q. And it's dated January 4, 1980. See that?
7 A. That's right.
8 Q. And it says, "For some time, we have been aware
9 of the relationship between smoke pH (TPM) and free
10 nicotine delivered in tobacco smoke. This note will
11 focus on these observations which may be important to
12 B&W as the industry moves toward lower nicotine
13 products." Do you see that?
14 A. Yeah. That's what it says.
15 Q. Now it shows two products, the Marlboro 85 and
16 the Merit; correct?
17 A. That's right.
18 Q. And it shows the total nicotine delivered for
19 each one; correct?
20 A. The first column says milligrams total nicotine
21 delivered, that's correct.
22 Q. And for Marlboro it was 1.15 milligrams?
23 A. That would be 1.15 milligrams per cigarette.
24 Q. And for Merit it was .64 milligrams; correct?
25 A. That's correct, per cigarette.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953

- 1 Q. And then do you see the free nicotine and the
2 percentage of free nicotine?
3 A. Okay. I see those numbers.
4 Q. And the free nicotine percent was 28.7 for the
5 Marlboro 85 and 50.0 for the Merit; correct?
6 A. That's what these numbers are. And just like
7 the last document, I don't understand those numbers
8 and what's given here.
9 Q. Now the RJR cigarettes have nicotine that runs
10 from, I think you said, .05 up to, what was it, one
11 point -- how high does your nicotine go?
12 A. We have some products that go as low as .05.
13 Typically the higher tar products are about .14,
14 thereabouts.
15 Q. .14.
16 A. I'm sorry, 1.4 milligrams per -- per cigarette.
17 Q. Now then it's stated in this document, right
18 below those numbers that show the 28.7 and 50 percent
19 of free nicotine, "In theory, a person smoking these
20 cigarettes would not find appreciable difference in
21 the physiological satisfaction from either based on
22 the amount of free nicotine delivered." Correct? Is
23 that what it says?
24 A. That's what it says.
25 Q. Now can you direct your attention to Exhibit

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953

CROSS-EXAMINATION - DAVID E. TOWNSEND

- 1 13155.
2 There are, sir, are there not, a number of ways
3 to increase pH in a cigarette?
4 A. I think there's a number of ways that pH could
5 be increased if certain compounds or materials are
6 added to cigarettes at high levels.
7 Q. You could increase the amount of burley in the
8 blend; couldn't you?
9 A. Certainly changing the burley to flue-cured to
10 oriental ratios in a blend does affect and can affect
11 pH.
12 Q. You can reduce the casing sugar used on a burley
13 and/or the blend; correct?
14 A. The level of casing or no casing can affect the
15 pH.
16 Q. You could use alkaline additives including
17 ammonia; correct?
18 A. That's entirely possible at high enough levels.
19 Q. You could add nicotine to the blend; can't you?
20 A. That's possible. That would change nicotine --
21 pH --
22 Q. You could --
23 A. -- if you add -- if you add enough.
24 Q. You could remove acids from the blend; correct?
25 A. That's certainly a possibility, if one did it in

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953

CROSS-EXAMINATION - DAVID E. TOWNSEND

- 1 the right way and removed enough acids.
2 Q. You can ventilate the cigarette; correct?
3 A. Air dilution does affect the empirical measure

4 of pH. No question about it.
5 Q. And you can have special filter systems; can't
6 you?
7 A. Well it's possible. I'm not sure what you mean
8 by such a general statement as "special filter
9 systems."
10 Q. Well --
11 A. It's easy to imagine that one could put acids or
12 bases on a filter and affect the overall smoke pH.
13 Q. Now Exhibit 13155 is entitled "IMPLICATIONS AND
14 ACTIVITIES ARISING FROM CORRELATION OF SMOKE pH WITH
15 NICOTINE IMPACT, OTHER SMOKE QUALITIES, AND CIGARETTE
16 SALES;" correct?
17 A. That's the title of it.
18 Q. And it was authored by Dr. Teague; correct?
19 A. Yes.
20 Q. It was authored back in 1973; correct, sir?
21 A. I actually don't see a date on here. If you
22 could point me to one.
23 Q. Well if you look at the attachments, you'll see
24 that they have letters attached that are 1973, so I'm
25 asking you to assume that it was sometime back in

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10593

1 1973.
2 A. Well I guess if the attachments are '73, then it
3 has to -- has to mean it was '73 or later.
4 Q. Now doctor, you testified that in 1994 there was
5 roughly 39 percent of Reynolds cigarettes had
6 ammonia; is that what you said?
7 A. I did testify that 39 percent of the cigarettes
8 that R. J. Reynolds sold in 1994 used ammoniated
9 reconstituted tobacco.
10 Q. Did you mean to say the number of cigarettes or
11 the percentage of the market share of the cigarettes
12 that were ammoniated?
13 A. My understanding -- and I talked to one of our
14 brands R&D people -- my understanding is that it was
15 the number of brand styles that we sell, thirty -- 39
16 percent.
17 Q. You don't know what percentage of sales were
18 with ammoniated cigarettes; do you?
19 A. Ah --
20 Q. You yourself, sir.
21 A. Sorry?
22 Q. You yourself do not know that; do you?
23 A. I don't have a definitive number. I'll tell you
24 it's around the same number, because we've done that
25 analysis in other years and it's -- it's very

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10594

1 similar.
2 Q. And for the years leading up to 1994 when all
3 these activities were starting, the FDA, et cetera,
4 it was upwards of 90 percent of your cigarettes were
5 ammoniated; weren't they?
6 A. That's hard for me to imagine.
7 Q. Do you know if it went as high as 97 percent of
8 the cigarettes that were sold were ammoniated?

9 A. I don't believe that as I sit here.
10 Q. You've never checked the data looking at your
11 formulas and to see what cigarettes those are for,
12 and then matching those cigarettes against sales;
13 have you?
14 A. I've looked at many formulas. I've looked at
15 many different brands. I know that many of our
16 brands have not been ammoniated, and some of our
17 larger brands, like Salem, have been ammoniated in
18 the past for only a year or two. It's hard for me to
19 imagine your assertion that 97 percent of our brands
20 are ammoniated.
21 Q. That's not what I said.
22 A. I thought --
23 Q. That's not what I asked you.
24 A. I'm sorry, I thought that was.
25 Q. You have never looked to determine how many of

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10595

1 your cigarettes were ammoniated and then comparing
2 that to your sales to see what percentage of your
3 sales were from ammoniated cigarettes; have you?
4 A. Are you asking me personally?
5 Q. Yes.
6 A. Personally I have never made that comparison.
7 Staff in R&D have.
8 Q. Okay. So you do not know of your own personal
9 knowledge whether or not up to 97 percent or more of
10 your sales were from ammoniated cigarettes; do you?
11 A. I don't think that's a fair suggestion at all
12 because I've been through some of these data in
13 detail with some R&D staff.
14 Q. Do you recall, then, by going through this, that
15 there were years that were as high as 97 percent?
16 A. Of our total shipment volume?
17 Q. Of your total sales.
18 A. I have never seen data that come anywhere close
19 to that.
20 Q. Now if you could direct your attention to
21 Exhibit 13155.

22 MR. CIRESI: And Your Honor, that might be
23 a good place to break.

24 THE COURT: Why don't we recess for lunch
25 and reconvene at 10 minutes past 2:00.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10596

1 THE CLERK: Court stands in recess to
2 reconvene at 2:10.

3 (Recess taken.)
4
5
6
7
8
9
10
11
12
13

14
15
16
17
18
19
20
21
22
23
24
25

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10597

1 AFTERNOON SESSION.
2 THE CLERK: All rise. Court is again in
3 session.
4 (Jury enters the courtroom.)
5 THE CLERK: Please be seated.
6 THE COURT: Counsel.
7 MR. CIRESI: Thank you, Your Honor.
8 Good afternoon, ladies and gentlemen.
9 (Collective "Good afternoon.")
10 BY MR. CIRESI:
11 Q. Good afternoon, doctor.
12 A. Good afternoon.
13 Q. Can you go back to volume two. We were at
14 Exhibit 13155.
15 A. Okay.
16 Q. Dr. Teague's memorandum.
17 A. Yes.
18 Q. If you turn to the first page after the table of
19 contents.
20 A. Okay.
21 Q. Dr. Teague outlines there the objectives of the
22 memorandum; correct?
23 A. He has "INTRODUCTION" and "OBJECTIVES" in one
24 section.
25 Q. Okay. And he states that "This year the

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10598

1 continuing, vigorous sales growth of various
2 competitive cigarette brands, especially Marlboro and
3 Kool, prompted an intensive study of the physical and
4 chemical properties of those brands as compared with
5 our brands." Correct?
6 A. That's correct. That's what it says.
7 Q. And at this time in 1973, RJR was the leading
8 cigarette manufacturer; was it not?
9 A. That's correct.
10 Q. And if you go down under the "HISTORICAL DATA,
11 TRENDS AND BRAND COMPARISONS" to the last paragraph,
12 he shows -- or he sets forth what the data show;
13 correct?
14 A. He discusses how he interprets -- or what he
15 interpreted from the data.
16 Q. And he says that the "data show that smoke from
17 our brands, and all other significant competitive
18 brands, in recent years has been consistently and

19 significantly lower in pH (less alkaline) than smoke
20 from Marlboro and to a lesser degree Kool;" correct?
21 A. That's what that says.
22 Q. And then he refers to various charts that are
23 attached to this memorandum; correct?
24 A. That's correct.
25 Q. And then he states that "All evidence indicates
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10599

1 that the relatively high smoke pH (high alkalinity)
2 shown by Marlboro (and other Philip Morris brands)
3 and Kool is deliberate and controlled. This has
4 raised questions as to: (1) the effect of higher
5 smoke pH on nicotine impact and smoke quality, hence
6 market performance, and (2) how the higher smoke pH
7 might be accomplished." Correct?
8 A. That's what he says.
9 Q. And over on page two he sets forth information
10 regarding smoke pH and free nicotine; does he not?
11 A. Yes.
12 Q. He states that "In essence, a cigarette is a
13 system for delivery of nicotine to the smoker in
14 attractive, useful form;" doesn't he?
15 A. That's what he says.
16 Q. And he states that "At 'normal' smoke pH, at or
17 below with 6.0, essentially all of the smoke nicotine
18 is chemically combined with acidic substances, hence
19 is non-volatile and use -- and relatively slowly
20 absorbed by the smoker." Do you see that?
21 A. I see that.
22 Q. He states that "As the smoke pH increases above
23 about 6.0, an increasing proportion of total smoke
24 nicotine occurs in 'free' form, which is volatile,
25 rapidly absorbed by the smoker, and believed to be

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10600

1 instantly perceived as nicotine 'kick.'" Correct?
2 A. That's what he says.
3 Q. And then down in paragraph four, Roman numeral
4 IV, he talks about smoke pH and other smoke
5 qualities; correct?
6 A. That's the title of that section.
7 Q. And he points out there that "In addition to
8 enhancing nicotine 'kick', increasing the pH
9 (increasing alkalinity) of smoke above about 6.0
10 causes other changes, particularly when the increase
11 in smoke pH is achieved by adding ammonia to the
12 blend." Correct?
13 A. That's what he says, yes.
14 Q. He says that "As smoke pH increases, in general
15 stemmy taste, mouth irritation, flue-cured flavor and
16 Turkish flavor are diminished, and burley flavor and
17 character are enhanced;" correct?
18 A. That's what he says.
19 Q. And if you go over to the next page, he talks
20 about marketing correlations and implications; does
21 he not?
22 A. Yes.
23 Q. And he refers to charts where there were

24 statistical correlations done with respect to the
25 investigations that they made; correct?

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10601

1 A. He refers to some attempts at correlating data.

2 Q. And he states --

3 He doesn't call it an attempt, he calls it what
4 they did; didn't he, sir? He references the charts.

5 A. He references the charts in here.

6 Q. He doesn't say they attempted, he says what they
7 did; right?

8 A. What line are you reading from?

9 Q. The second and third paragraph.

10 A. Okay.

11 Q. If you'd take a look at them.

12 A. Okay. And your question is?

13 Q. He says what the people at Reynolds did in
14 conducting this investigation; correct?

15 A. He makes it clear that these charts show
16 comparisons of certain data, that's right.

17 Q. And the last paragraph there he says that
18 "Subsequent detailed analysis by Marketing Research
19 of our pH and 'free' nicotine data along with sales
20 data and other factors has confirmed the strongly
21 positive correlation between 'free' nicotine and
22 smoke (determined by pH and total nicotine in smoke)
23 and market share performance." Correct?

24 A. That's what he says.

25 Q. And if you go on to the next page, he points out

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10602

1 that the research department has correlated,
2 interpreted, and described to management data on the
3 smoke pH of the various brands; doesn't he? Right
4 under "RESEARCH ACTIVITIES, CURRENT AND PLANNED."

5 A. Okay. I'm sorry, your question was?

6 Q. He points out that the collaborative effort that
7 has been conducted has been pointed out by research
8 to management; correct?

9 A. I don't see where it says management here.

10 Q. "As its part in" --

11 A. Oh, I do see it. Sorry.

12 Q. You do see it, sir?

13 A. Uh-huh.

14 Q. And then in the last paragraph he points out the
15 methods by which smoke pH or nicotine kick may be
16 increased; correct?

17 A. In a general sense, that's correct.

18 Q. And those are the factors that we talked about
19 this morning before we recessed; isn't that correct?

20 A. This appears to be the list that you read out to
21 me.

22 Q. Those are a number of the factors that I listed
23 this morning; correct, that you agreed with?

24 A. These appear to be the factors that you read out
25 this morning.

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

- 1 Q. Now if you go through this document, back to the
2 page which bears the Bates number 4140 -- and I
3 apologize to you, doctor, they're not in order, but
4 this document had to be put together -- it's the
5 sixth page from the end.
6 A. 4140. Okay.
7 Q. Do you have it?
8 A. Yes.
9 Q. Now this is a July 12th, 1973 RJR confidential
10 memorandum to Mr. Smith from Mr. Blevins; correct?
11 A. Yes.
12 Q. And Mr. Smith was the chairman of the board of
13 RJR; correct?
14 A. I'm not sure whether he was the chairman of the
15 board. I know he was president, I believe, of the
16 company.
17 Q. Do you know if Mr. Hobbs, who a cc copy went to,
18 was president?
19 A. That may be well --
20 That may be accurate at this time. I just don't
21 recall specifically.
22 Q. And do you remember that Mr. Tucker was a
23 vice-president?
24 A. I believe that's right.
25 Q. And at the very bottom of this --

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

- 1 Well let's start at the top. In this memorandum
2 Mr. Blevins tells the chairman of the board, the
3 president and the vice-president about free nicotine
4 and what they have reviewed and found; correct?
5 A. This discusses free nicotine.
6 Q. And what Reynolds' research and development
7 department and marketing department had found;
8 correct?
9 A. I don't see a reference to marketing and R&D
10 here, but I -- it does speak to free nicotine.
11 Q. Well you know that, from looking at the previous
12 parts of this memorandum that we just went through,
13 that marketing was involved in looking at sales, et
14 cetera?
15 A. Yes.
16 Q. Correct?
17 A. That's correct.
18 Q. And he says here that "We have reviewed free
19 nicotine, advertising expenditures," et cetera; does
20 he not?
21 A. He says that here.
22 Q. Okay. And at the very last paragraph he states
23 that "Our analysis suggests that pH does not
24 correlate as closely with share performances as does
25 free nicotine." Correct?

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

- 1 A. That's what he says.
2 Q. Says that "Our emphasis should be directed
3 toward free nicotine while pH would provide us with a
4 measure of or tool to effect free nicotine."

5 Correct?
6 A. That's what he says.
7 Q. And if you turn over two further pages, you'll
8 see a memo from a Mr. Hind to the president, Mr.
9 Hobbs, on August 14th, 1973, or about a month after
10 the letter with just looked at. Do you see that?
11 A. I see that.
12 Q. Marked secret in the upper right-hand corner?
13 A. It's handwritten secret.
14 Q. And it's got Dr. Senkus and Dr. Teague's name
15 on?
16 A. It's --
17 Handwritten at the top it does, yes.
18 Q. And a carbon copy went to Mr. Sandefur; correct?
19 A. Mr. Sandefur's name is down here. I don't see
20 carbon copy to him, but his name is here certainly.
21 Q. Okay. And he became a president of RJR; did he
22 not?
23 A. I'm not certain.
24 Q. Did he also become CEO of Brown & Williamson?
25 A. That's correct.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10606

1 Q. And this is talking about "Tobacco Development
2 Product Direction;" correct?
3 A. That's the title.
4 Q. And it states that "The attached represents the
5 Marketing Department's understanding of agreed to
6 product objectives for Tobacco Development's
7 direction." Correct?
8 A. That's what it says, that's correct.
9 Q. "If they meet your approval, we request that you
10 forward to Tobacco Development and coordinate with
11 Dr. Senkus of Research;" correct?
12 A. You read that correctly.
13 Q. And further states that "As agreed, this
14 research program should also answer the question of
15 the maximum acceptable level of pH that optimizes
16 tobacco satisfaction." Correct?
17 A. That's what it says.
18 Q. Now if you go, then, to the attachment, sir,
19 which is the next page, this again is marked RJR
20 secret in the upper left-hand corner; correct?
21 A. Yes, it is.
22 Q. And it's "PRODUCT DEVELOPMENT DIRECTIONS TO TD."
23 TD is Tobacco Development; correct?
24 A. That's correct.
25 Q. And it lists in the left-hand column a number of

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10607

1 the brands; correct?
2 A. It has a column called brands or styles.
3 Q. And that goes on for three pages; correct?
4 A. I have three pages here.
5 Q. And then it has development directions; correct?
6 A. That's correct.
7 Q. And for the Winston King it states "Maintain
8 basic integrity of current Winston King blend with
9 adjusted pH factor towards Marlboro King." Correct?

10 A. That's what it says.
11 Q. And it says the same with regard to the Camel
12 Filter; correct?
13 A. Yes, sir.
14 Q. And it says in the next one, "Significantly
15 revise Camel Filter, replicate the Marlboro blend in
16 all respects;" correct?
17 A. That's what it says.
18 Q. And with regard to Salem King it says "Maintain
19 basic integrity of current Salem King blend with
20 adjusted pH factor towards the Kool King." Correct?
21 A. That's what it says.
22 Q. If you go on to Salem King on the next page, it
23 talks about adjusting the pH factor towards the Kool
24 King of the Salem King; correct?
25 A. That's what it says, that's correct.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10608

1 Q. I'm sorry, did you --
2 A. I said that's what it said.
3 Q. Thank you.
4 Now can you direct your attention to Exhibit
5 12464, which is a December 4th, 1973 memorandum.
6 Now this is about 21 years before the FDA
7 started looking at regulating cigarettes as a drug;
8 correct, sir?
9 A. I'm sorry?
10 MR. WEBER: I object, Your Honor.
11 THE COURT: I'm sorry?
12 MR. WEBER: I -- I object with the
13 continued references to the FDA issue. I think it's
14 argumentative.
15 THE COURT: I don't see it. I don't think
16 it's argumentative.
17 BY MR. CIRESI:
18 Q. Sir, this was about 21 years before the FDA
19 looked at regulating cigarettes as a drug; correct?
20 A. I'm sorry, I was getting the document out. What
21 was your question?
22 Q. This last document we looked at, 13155, was
23 about 21 years before the FDA looked at regulating
24 cigarettes as a drug; correct?
25 A. As a drug-delivery device, I believe that's

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10609

1 correct. That's approximately right.
2 Q. Can you turn, then, to Exhibit 12464. Do you
3 have that, sir?
4 A. Yes, sir.
5 Q. Now that's a memorandum from Dr. Colby to Mr.
6 Blevins, Jr., who's the director of marketing;
7 correct?
8 A. It he's director of marketing planning.
9 Q. And do you know what Dr. Colby's title was in
10 1973?
11 A. I'm not entirely sure in 1973. As long as I
12 knew, Dr. Colby was the head librarian at R&D.
13 Q. He was a senior scientist; wasn't he, sir?
14 A. He was also the head librarian, sir.

15 Q. He was a senior scientist in the department;
16 wasn't he?
17 A. What do you mean by "senior scientist?" Was
18 that his title?
19 Q. Don't you understand what a senior scientist is
20 at RJR?
21 A. He was a scientist that worked in the R&D
22 department, and I don't know what his actual level
23 was. But he was the head librarian.
24 Q. Are you trying to diminish what he did by
25 calling him the head librarian?

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10610

1 A. Absolutely not.
2 Q. Is that -- is that your implication?
3 A. Absolutely not. You just asked me a question.
4 I answered. That's all.
5 Q. Now in 1973 Dr. Colby reported to Mr. Blevins
6 about a youth appeal brand; correct?
7 A. That seems to be the essence that's in the
8 summary.
9 Q. And if you go down to the last paragraph on the
10 first page, do you see that he's referring to the
11 fact that "any desired additional nicotine 'kick'
12 could easily be obtained through pH regulation?"
13 A. That's what it says in that last sentence.
14 Q. And can you direct your attention --
15 And this, by the way, would be after Dr.
16 Teague's memo that we just saw, 13155; correct?
17 A. This is in December of '73, so I assume so.
18 Q. And can you direct your attention, then, to a
19 1976 memorandum from Dr. Rodgman, Exhibit 12515.
20 A. Okay.
21 Q. This is the --
22 The subject of this is "The Merit Cigarette;"
23 correct?
24 A. The title is "The Merit Cigarette."
25 Q. And Dr. Rodgman was in the research and

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10611

1 development department?
2 A. Yes.
3 Q. And Dr. Laurene, --
4 A. Yes.
5 Q. -- he was in the research and development
6 department?
7 A. Yes.
8 Q. And can you direct your attention to the third
9 page of that memorandum.
10 A. Okay.
11 Q. And do you see there pH numbers listed?
12 A. Yes, I do.
13 Q. For the Merit it was 6.66; correct?
14 A. That's what it says.
15 MR. WEBER: Excuse me, Your Honor, my
16 records don't show that that's in evidence.
17 MR. CIRESI: And I apologize for that. It
18 isn't, Your Honor. I'd offer Exhibit 12515.
19 MR. WEBER: No objection, Your Honor.

20 THE COURT: Court will receive 12515.
21 BY MR. CIRESI:
22 Q. We have the first page up, doctor, for the jury
23 to see. That's dated June 2nd, 1976; correct?
24 A. That's correct.
25 Q. And it's from Dr. Rodgman to Dr. Laurene;
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND
10612
1 correct?
2 A. That's correct.
3 Q. And if we then go to page three, under the title
4 "Smoke" and "General Information," we see some
5 average pH numbers; correct?
6 A. We see some pH numbers in the right-hand part of
7 that table.
8 Q. And they're entitled "Average pH;" correct?
9 A. It says "Average pH," footnote a.
10 Q. And average is average of average maximum and
11 average minimum; correct?
12 A. That's what it says in footnote a.
13 Q. And the Merit has a 6.66 pH; correct?
14 A. That's what's in this table.
15 Q. Marlboro 6.59; correct?
16 A. That's what it says.
17 Q. Winston 6.13; correct?
18 A. That's what it says.
19 Q. Vantage 6.39; correct?
20 A. That's what it says.
21 Q. And Now 7.30; correct?
22 A. That's what it concludes here as well.
23 Q. Was Now a low tar cigarette?
24 A. Yes.
25 Q. Can you direct your attention to Exhibit 12505,
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND
10613
1 which is in 1980, four years after this. That's a
2 memorandum to Dr. Morse from Dr. Rodgman; correct?
3 A. That's correct.
4 Q. Dr. Morse was in the research and development
5 department?
6 A. Yes, he was.
7 Q. And the subject of this is "Clarification of my
8 7/22/80 Memo on Nicotine Additive;" correct?
9 A. Yes, "(Horrigan Memo of 7/3/1980; CGT Memo of
10 7/8/1980)."
11 Q. And that Horrigan is the same Mr. Horrigan that
12 we saw back in Exhibit 13155; correct, sir?
13 A. I don't remember that number exhibit. What --
14 what document was it?
15 Q. That was Dr. Teague's memorandum in 1973, and
16 there was an attachment to that document which bore
17 the name of Mr. Horrigan. Do you remember that?
18 A. No, I don't remember that specifically.
19 Q. Remember I asked whether he was the president of
20 RJR at one time and whether he was the president of
21 Brown & Williamson, you said yes, he was at Brown &
22 Williamson, you couldn't remember if he was at RJ --
23 RJR?
24 A. You were talking about Sandefur.

25 Q. Was it Sandefur?

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10614

1 A. Sandefur was on the earlier document that you
2 asked me those specific questions.

3 Q. Was Horrigan on that memo, too?

4 A. I don't recall his name on that memo --

5 Q. All right.

6 A. -- at all.

7 Q. Now if you look at this paragraph, second full
8 paragraph, "Development of nicotine technology" --

9 Do you see that?

10 A. Yes.

11 Q. -- "involves the study of a host of factors,
12 chief among which are" and then it lists four;
13 correct?

14 A. Yes.

15 Q. And under d. it says "Nicotine satisfaction:
16 This is dependent on puff count, puff volume,
17 tar/nicotine ratio, total nicotine delivery, nicotine
18 delivery per puff, plus 'free' nicotine per puff."
19 And it has footnote a; correct?

20 A. That's correct.

21 Q. And footnote a says "Most, if not all, nicotine
22 in tobacco is present as a salt, the reaction product
23 of nicotine and an acid, generally referred to as
24 'bound' nicotine; most of the nicotine in smoke is
25 present as a salt or 'bound' form and a small

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10615

1 fraction is present as 'free' nicotine. The
2 percentage 'free' nicotine depends on the smoke pH.
3 'Free' nicotine is absorbed more rapidly by the
4 smoker than is 'bound' nicotine." Correct?

5 A. I see where he says that.

6 Q. And going back up to subparagraph d., we see
7 that free nicotine is related to nicotine delivery
8 per puff and smoke pH; correct?

9 A. "The latter in turn is related to nicotine
10 delivery per puff and smoke pH."

11 Q. And then there's a number of charts accompanying
12 this memorandum; correct, sir?

13 A. There are a number of charts.

14 Q. And if you'd go to the page which bears the
15 Bates number 2722.

16 A. Okay.

17 Q. That shows a comparison between the Winston and
18 the Marlboro and shows Winston catching up in free
19 nicotine per puff in 1980; doesn't it?

20 A. What this shows -

21 What this chart shows is in 1980 the free
22 nicotine, I believe it is in the left-hand side, free
23 nicotine per puff is the same value in 1980.

24 Q. And if you go back, then, to page one, Dr.
25 Rodgman points out that that's what Table I and the

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10616

1 attached graphs indicate; isn't that right?
2 A. Is what right?
3 Q. He states, "Table I and the attached graphs
4 indicate that, as a result of R&D efforts since mid-
5 1977, we have 'caught up' to Philip Morris insofar as
6 its current use in the Marlboro of nicotine
7 technology is concerned; our approach has been
8 primarily one of controlling the smoke parameters
9 noted above by blend formulation and denicotinization
10 rather than by addition or transposition of
11 nicotine;" correct?

12 A. You read that correctly.

13 Q. And "controlling the smoke parameters" means
14 controlling through blend formulations; correct?

15 A. He said that "our approach has primarily been
16 one of controlling the smoke parameters noted above
17 by blend formulation and denicotinization."

18 Q. And blend formulation, sir, relates to the
19 formulas of the blend; correct?

20 A. I think that is reasonable.

21 Q. And one of the characteristics or products
22 controlled is nicotine in a blend formulation;
23 correct?

24 A. I think nicotine certainly is different in
25 different blend formulations by virtue of choosing

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10617

1 different proportions of different types of tobacco.

2 Q. It's a recipe; correct?

3 A. We don't --

4 I don't call it a recipe and I don't think my
5 staff do, by and large. It's certainly a formula.
6 It's a blend composition or a blend -- a blend that's
7 composed of a number of different tobacco types that
8 have different nicotine levels, certainly.

9 Q. And those different nicotine levels that result
10 from the different blend formulations can have
11 different pH values; can't they?

12 A. Well certainly if one makes very different blend
13 formulations that have different nicotine content in
14 the total blend, that's going to affect pH. That
15 should affect the pH -- pH to a degree and to a small
16 degree.

17 Q. Can you turn, then, to Exhibit 13141. That's in
18 volume two, sir. This is a technology sheet from
19 RJR. The technology is ammoniation, do you see that?

20 A. It says at the top "TECHNOLOGY: Ammoniation."

21 Q. And if you look under the "Background"
22 section, --

23 A. Okay.

24 Q. -- if you go down to the third-to-the-last
25 paragraph starting with the word "RJR...?"

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10618

1 A. Yes.

2 Q. Do you see that?

3 A. Yes.

4 Q. "RJR introduced ammoniated sheet material in the
5 Camel Filter product in 1974. Better market

6 performance was indicated in the subsequent years.
7 "Low 'tar' products at RJR were designed with
8 ammoniated sheet material beginning in 1974."
9 Correct?
10 A. That's what it says here.
11 Q. And by "design," we're talking about the
12 formulas of the blend; correct, sir?
13 A. I think there were two things in here. The
14 Camel certainly was ammoniated and placed in the
15 market in 1974, and they speak to that in what you
16 referenced. Later on I believe there's a reference
17 to ammoniation of Winston -- or of reconstituted
18 sheet and Winston King Size in 1979, and it's clear
19 that was placed in the market. I know that there
20 were a number of cigarette design exploratory
21 projects to develop -- to try to develop low tar
22 products with ammoniated reconstituted sheet.
23 Q. Is the answer to my question yes?
24 A. And your question was?
25 MR. CIRESI: May I have the question back,
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10619

1 please.
2 (Record read by the court reporter.)
3 A. By designing low tar products with ammoniated
4 sheet, that would certainly speak directly to the
5 blend formulation design.
6 Q. Thank you.
7 And the next page, as you pointed out, deals
8 with the Winston King Size product in '79; correct?
9 A. That's correct.
10 Q. And market tests indicated significant product
11 improvement after that ammoniated sheet was
12 introduced; correct?
13 A. That's what it says.
14 Q. And then it goes down to state the product
15 characteristics; correct?
16 A. There's a list of -- of product characteristics.
17 Q. "Milder smoother taste;" correct?
18 A. That's what it says.
19 Q. "Higher smoke pH;" --
20 A. That's --
21 Q. -- correct?
22 A. -- what it says.
23 Q. "More chocolate-burley type; positive flavor
24 without negative burley characteristics;" correct?
25 A. That's what it says.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10620

1 Q. Some of the same type of things that were being
2 discussed back in the 1973 memo of Dr. Teague;
3 correct?
4 A. Certainly.
5 Q. "Cleaner taste with more free nicotine;"
6 correct?
7 A. That's what it says.
8 Q. "Stronger physiological impact with less
9 harshness;" correct?
10 A. That's what it says again.

11 Q. Physiological impact in cigarettes comes from
12 the nicotine; correct?
13 A. I would think that would be a reasonable
14 assumption.
15 Q. "Differing flavor effects depending upon the
16 type of tobacco ammoniated;" correct?
17 A. That's what it says.
18 Q. Once again, that goes to the -- and excuse my
19 term -- but the recipe nature of your business in
20 formulating blends and using differing types of
21 tobaccos; correct?
22 A. Our product developers formulate different
23 blends with different proportions of different types
24 of tobaccos. No question about it.
25 Q. And this was in 1981; isn't that right, sir?
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND
10621
1 A. This was a 1980 document, I believe; wasn't it?
2 Q. 1981.
3 A. Where do you see a date?
4 Q. That's what we were advised by answers to
5 interrogatories during the course of discovery.
6 A. Oh. Well I don't know. There's no date on
7 here. I don't know for sure.
8 Q. Can you direct your attention now to Exhibit
9 12800.
10 A. Okay.
11 Q. Have you seen this document before?
12 A. Yes, I have.
13 Q. It's a memorandum from E. Bernasek and C.
14 Nystrom to Dr. G. R. DiMarco; correct?
15 A. That's correct.
16 Q. And Dr. DiMarco at that time was what?
17 A. He was head of R&D at R. J. Reynolds.
18 Q. Vice-president; correct?
19 A. That's correct.
20 Q. And Mr. Bernasek and Mr. Nystrom were both
21 chemists, Ph.D.'s in the department?
22 A. Ed Bernasek is a chemist -- was a chemist in the
23 R&D department. Charlie Nystrom also is a chemist in
24 the R&D department. They both were Ph.D. chemists.
25 Q. And they attached position papers describing the
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND
10622
1 rationale of the research and development department
2 for using the following additives in RJRT tobacco
3 formulations; correct?
4 A. Yes.
5 Q. Those are the blends we're talking about;
6 correct?
7 A. The tobacco flavor formulations?
8 Q. Yes.
9 A. No.
10 Q. They're part of the blends; are they not?
11 A. Tobacco flavor formulations are ingredients to
12 the blend. So one makes up a blend, one may then use
13 ingredients, such as ammoniating reconstituted
14 tobacco.
15 Q. Fair enough.

16 They're the ingredients that go into the blends;
17 correct?
18 A. I think I've already answered that.
19 Q. And this is the rationale for using those
20 additives as described to the heads of R&D by two
21 chemist Ph.D.'s in 1982; correct?
22 A. Yeah. I was just looking for a date. I believe
23 it was 1982. My exhibit is blurred.
24 Q. Well you see it says "Based on our discussion on
25 July 16, 1982..." See that, sir?

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10623

1 A. Well I see that. I was looking for a date on
2 the document. I thought that was the question.
3 Q. If you'd turn to the next page, you see the
4 draft is 8-9-82. Do you see that?
5 A. That's what I looked for and found.
6 Q. Now if you go to the page which bears Bates
7 number 8509.
8 A. Okay.
9 Q. And by the way, this is about 12 years before
10 the FDA looked at regulating cigarettes as a
11 drug-delivery device; correct?
12 A. That's about the right length of time.
13 Q. Before the flap that you talked about; correct?
14 Twelve years before that flap; is that right?
15 A. When I said "flap," I wasn't referring to the
16 FDA's investigation, I was talking about the
17 allegations over pH, so please don't mischaracterize
18 what I'm saying.
19 Q. Well that's the allegation that the FDA looked
20 into; isn't it?
21 A. Among others. And I made that clear in my
22 testimony as well.
23 Q. So there were other parts of the flap or
24 controversy that the FDA also looked into; is that
25 right?

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10624

1 A. I --
2 Can you ask that question again, please?
3 Q. Sure. Were there other parts of the flap or
4 controversy besides ammoniation on nicotine that the
5 FDA looked into in 1994 before they decided to
6 regulate cigarettes as a drug-delivery device?
7 A. I tried to make it clear, when I referred using
8 the term "flap," I was referring to the allegations
9 over pH and that only.
10 Q. Now on page 8509, the rationale for ammoniation
11 of reconstituted tobacco is set forth by the pH
12 chemists to the vice-president and head of R&D;
13 correct?
14 A. You mean Ph.D. chemists?
15 Q. Ph.D. chemists. That's right.
16 A. That's not what you said.
17 Q. Well I'm sorry, sir, if I misspoke. The Ph.D.
18 chemists to the vice-president of R&D; is that right?
19 A. This document was written for the vice-president
20 of R&D, Dr. DiMarco.

21 Q. And it states that "Studies on the ammoniation
22 of reconstituted tobacco were started in 1973 as a
23 result of R&D studies carried out during the '50s and
24 early 1970." Do you see that?

25 A. That's what it says, that's correct.

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953

CROSS-EXAMINATION - DAVID E. TOWNSEND

10625

1 Q. Now "started in 1973," that's the time of the
2 Teague memo that we saw; correct?

3 A. Yeah, that's about the same time.

4 Q. "During the '50s, Dr. C. E. Teague, Jr.
5 investigated the ammoniation of tobacco and tobacco
6 stems and reported dramatic improvements in the
7 smoking qualities of ammoniated tobacco stems. Smoke
8 harshness and irritation were reduced and taste
9 properties were improved." Correct?

10 A. That's what it says.

11 Q. And then it says, "In the early 1970s, a major
12 R&D program was initiated to investigate the physical
13 chemistry of tobacco and tobacco smoke in an attempt
14 to gain a better understanding of the factors
15 affecting smoke harshness, irritation and strength,"
16 and that those studies led to the following
17 observations and conclusions; correct?

18 A. That's what it says, that's correct.

19 Q. And the 1973 memo that we saw from Teague
20 referred to those studies; did it not?

21 A. I think it -- it referred to and recommended
22 some studies. I don't know that it's referring to
23 exactly the same thing they are here.

24 Q. Well --

25 A. I'd have to go back and compare the documents.

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953

CROSS-EXAMINATION - DAVID E. TOWNSEND

10626

1 Q. Well 1973, you would agree, was the early 1970s.

2 A. Well 1973 is early 1970s. But again, if you're
3 saying that these are the same things exactly that
4 Teague was talking about, I'd have to compare the two
5 documents.

6 Q. Well let's look at what is said here by Dr.
7 Bernasek and Dr. Nystrom.

8 Number one, "The pH of cigarette smoke is
9 important to smoke quality and can be used as a
10 measure of the physiological strength of smoke."
11 Correct?

12 A. That's what it says.

13 Q. That's what Dr. Teague was talking about in
14 early 1973 in that memo; wasn't it?

15 A. Dr. Teague had a number of theories on nicotine
16 and pH and free nicotine as it might impact the
17 physiological strength of smoke.

18 Q. And there were other individuals involved in
19 that study back in 1973 besides Dr. Teague; weren't
20 there?

21 A. What document are you referring to?

22 Q. Exhibit 13155, which set forth all of the
23 studies that were done and the recommendations to the
24 tobacco development program to alter pH. Do you
25 remember that?

10627

- 1 A. I remember that document.
2 Q. You don't --
3 You're not suggesting that that was done only by
4 Dr. Teague; are you?
5 A. No, I'm not suggesting that at all. I've
6 already said in earlier testimony in this court
7 that -- that a number of scientists had the same
8 theory as Dr. Teague, including RJR scientists.
9 Q. Number two, "Ammonia in smoke is one of the
10 major pH controlling components." Correct?
11 A. That's what it says.
12 Q. And that was set forth in Dr. Teague's memo;
13 correct?
14 A. There was something to that effect in Dr.
15 Teague's memo, as I recall.
16 Q. "Others" that can affect pH "include nicotine,
17 amines, organic acids and carbon dioxide;" correct?
18 A. Yes.
19 Q. And it's pointed out that "Ammonia occurs
20 naturally in tobacco..." correct?
21 A. Yes, "ranging from trace amounts in flue-cured
22 to over 1 percent in high quality cigar tobaccos."
23 Q. So it depends, again, on the types of blend
24 that's being put together for a particular cigarette
25 with regard to what type of ammonia occurs naturally;

10628

- 1 correct?
2 A. Different tobacco types have different
3 chemistry, so in a general sense I agree with what
4 you said.
5 Q. And in fact tobacco, such as Virginia bright,
6 can vary from year to year depending upon
7 climatological conditions; can't they?
8 A. Sure. Chemistry varies.
9 Q. If you go on to the next page, it's reported
10 that "Philip Morris introduced the use of added
11 ammonia in their cigarette products in 1965."
12 Correct?
13 A. That's what it says.
14 Q. And then in the next paragraph it points out
15 that "Philip Morris brands, especially Marlboro,
16 began growing in sales very rapidly after the
17 introduction of added ammonia." Correct?
18 A. That's also what it says here.
19 Q. It also says that "Correlation studies" --
20 And those were statistically conducted
21 correlation studies; weren't they, sir?
22 A. Statistically conducted correlation studies?
23 Q. Yes. To statistical significance; correct?
24 A. They calculated correlation coefficients, if
25 that's what you mean.

10629

- 1 Q. And they showed "relating increased smoke pH to

2 sales trends showed a very strong positive
3 correlation;" correct?
4 A. That's what it shows here.
5 Q. And then RJR conducted smoking panels; didn't
6 they?
7 A. Where are you?
8 Q. Number seven.
9 A. It refers to smoke panel results.
10 Q. And so RJR took this tobacco that was
11 ammoniated, put it in cigarettes, and conducted some
12 smoking tests with smokers; correct?
13 A. It says smoke panel results, so that's with
14 smokers.
15 Q. And "Studies of the effect of ammonia on smoke
16 composition showed a reduction in aldehydes,
17 especially formaldehyde, and an increase in the
18 levels of pyridines, pyrazines, and minor alkaloids;"
19 correct?
20 A. That's what it says.
21 Q. And the "Smoking panel results showed a decrease
22 in smoke irritation and harshness and an increase in
23 the physiological satisfaction with increasing
24 ammonia content;" correct?
25 A. That's what it says here, and I don't understand

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10630

1 it because I've never seen a panel -- a smoke panel
2 with any kind of measure of physiological
3 satisfaction.
4 Q. Well physiological satisfaction comes from the
5 effect of nicotine; correct, sir?
6 A. I've already --
7 I've already said that nicotine exerts a mild
8 pharmacology. Nicotine is a pharmacologically active
9 material that's in tobacco. I'm telling you that I
10 don't -- I've never seen a smoke panel test where
11 there's some kind of measure or questions about
12 physiological satisfaction.
13 Q. Now based on those observations that these two
14 Ph.D.'s pointed out to the vice-president of research
15 and development, it was decided by RJR to investigate
16 the use of ammoniated reconstituted tobacco as a
17 means of increasing smoke pH of RJRT's cigarette
18 products; correct?
19 A. That's what it says.
20 Q. And RJRT is R. J. Reynolds Tobacco Company;
21 correct?
22 A. That's correct.
23 Q. And then it references the fact that NFO
24 tests -- now that's National Family Organization?
25 A. National Family Opinion poll.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10631

1 Q. Okay. And these tests were conducted and they
2 indicated that smokers prefer products containing G7A
3 over products containing only G7. Do you see that?
4 A. I do, yes. Just barely.
5 Q. And G7A was the ammoniated product; correct?
6 A. G7A is reconstituted sheet that's been

7 ammoniated.
8 Q. And G7 was not ammoniated; correct?
9 A. G7 is our internal nomenclature for
10 reconstituted tobacco. G7 is not ammoniated.
11 Q. Then it points out that after these
12 investigations, there was the introduction of the
13 Camel Filter with G7A, which is the ammoniated
14 reconstituted tobacco, in 1975; correct?
15 A. It says, "Since the introduction in Camel Filter
16 in 1975, G7A has been tested and/or introduced in 19
17 additional brands."
18 Q. And the Camel Filter in 1975 had the
19 reconstituted G7A; didn't it, sir?
20 A. Reconstituted --
21 Ammoniated reconstituted tobacco was first
22 introduced in the market in 1974.
23 Q. That was in test markets; wasn't it?
24 A. In 1974?
25 Q. Yes.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10632

1 A. I believe that went national introduction in
2 1974, if I -- if I recall correctly.
3 Q. Do you have any document that would show that,
4 that it went in '74 as opposed to '75?
5 A. We've looked, and I believe there is
6 documentation of that.
7 Q. For national marketing in 1974?
8 A. That's my recollection.
9 Q. Okay. And that was reconstituted ammoniated
10 product.
11 A. Ammoniated -- ammoniated reconstituted tobacco I
12 believe was first introduced in Camel Filter in 1974.
13 My recollection is that that was the national launch
14 after a small test market. I believe it was 1974.
15 Q. Test market you said?
16 A. I said I believe it went into national
17 introduction after a test market.
18 Q. Okay.
19 A. After a small test market.
20 Q. Now there are subsequent documents showing the
21 ammoniation of R. J. Reynolds' products all the way
22 up through the 1990s; aren't there?
23 A. There are a number of documents speaking to
24 ammoniation and various results of ammoniation; for
25 example, the production of those flavorful compounds

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10633

1 we talked about yesterday, pyrazines and pyridines,
2 number of other things. There are many, many
3 documents in the R&D library about ammoniated
4 tobacco.
5 Q. And there are many, many documents which talk
6 about the effect of ammoniation on free nicotine all
7 the way up through the '90s; aren't there?
8 A. There are a number of documents that talk about
9 ammoniation and pH and free nicotine.
10 Q. And it is the free nicotine that passes into the
11 smoker's system and gives the physiological kick;

12 isn't it, sir?
13 A. Well I think nicotine certainly is -- is
14 physiologically active. There's a mild pharmacology.
15 Nicotine will get --
16 Of the smoke that smokers inhale, virtually all
17 of the nicotine is retained, regardless of the form.
18 Q. Sir, it is the free, unprotonated nicotine that
19 gets into the system; correct?
20 A. As you pointed out in an earlier question, the
21 free nicotine is probably the form that passes
22 membrane barrier -- membrane barriers.
23 Q. And that --
24 A. However, of the -- of the smoke that's inhaled,
25 virtually all of it's retained by smokers, and
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
CROSS-EXAMINATION - DAVID E. TOWNSEND

10634

1 regardless of the form. Now once it's retained, it
2 may convert to free nicotine and then pass into the
3 body.
4 Q. It has to be unprotonated to pass into the blood
5 system; doesn't it?
6 A. You've asked that question this morning, I
7 believe it was, and -- and I think in a general sense
8 I agree with it.
9 MR. CIRESI: Thank you, sir. I have no
10 further questions.
11 A. Not being a biologist --
12 MR. WEBER: Your Honor, I think we'll need
13 a few minutes to rearrange the equipment.
14 THE COURT: All right. We'll take a short
15 recess.
16 THE CLERK: Court stands in recess.
17 (Recess taken.)
18 THE CLERK: All rise. Court is again in
19 session.
20 (Jury enters the courtroom.)
21 THE CLERK: Please be seated.
22 THE COURT: Counsel.
23 MR. WEBER: Thank you, Your Honor.
24 Good afternoon, ladies and gentlemen.
25 (Collective "Good afternoon.")

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10635

1 REDIRECT EXAMINATION
2 BY MR. WEBER:
3 Q. Good afternoon, Dr. Townsend.
4 A. Good afternoon.
5 Q. Could you turn to tab 82, please, the which is
6 A --
7 Could you turn to tab 82, please, which is
8 AT001007.
9 A. Yes.
10 Q. And can you identify that as a document from J.
11 P. Dickerson is to D. H. Piehl dated December 27,
12 1977?
13 A. That's correct.
14 Q. And was this a document created and maintained
15 in the regular course of business at R. J. Reynolds?
16 A. Yes, this is a document from Reynolds.

17 MR. WEBER: Your Honor, I'd move the
18 admission of AT001007.
19 MR. CIRESI: No objection, Your Honor.
20 THE COURT: Court will receive AT001007.
21 BY MR. WEBER:
22 Q. And does this document --
23 Is this document entitled "HISTORIC TRENDS --
24 HISTORICAL TRENDS IN TAR AND NICOTINE AND SMOKE pH OF
25 WINSTON AND MARLBORO?"

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10636

1 A. That's correct.
2 Q. And it's dated the end of the year 1977?
3 A. December 27, 1977.
4 Q. And is that --
5 That's after the date of the Claude Teague
6 memorandum you were just discussing with Mr. Ciresi?
7 A. That's correct.
8 Q. Now let me read that first paragraph just to
9 make sure we know -- we understand the memorandum.
10 "Winston and Marlboro analyses for the '68 to '77
11 period were examined in an effort to identify factors
12 which might account for the weakening of the Winston
13 franchise, relative to Marlboro, in recent years.
14 Historical nicotine, tar and smoke pH data suggest
15 that relatively major changes have occurred in
16 Marlboro since 1969. On the other hand, only minor
17 changes have occurred in Winston. With the exception
18 of a gradual decrease in the tar delivery of Winston
19 during the '69 to '97 -- '77 period, most of the year
20 to year variations in smoke analyses of this
21 cigarette appear to be due to annual fluctuations in
22 the composition of the burley and flue-cured crops."
23 Do you see that?
24 A. Yes.
25 Q. Now the memorandum then goes on to analyze some

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10637

1 of the differences in the smoke of Winston and
2 Marlboro; does it not?
3 A. Yes, it does.
4 Q. Could you turn to the second page where there's
5 a reference to smoke pH.
6 A. Okay.
7 Q. It goes "Smoke pH of Marlboro has been higher
8 than that of Winston during the period for which
9 historical data are available. An increase in smoke
10 pH of Marlboro was observed in 1972. Marlboro smoke
11 pH decreased from 6.46 to 6.30 in 1974 and has
12 remained relatively constant since that time.
13 Winston smoke pH has apparently fluctuated with crop
14 changes."
15 Do you see that?
16 A. Yes.
17 Q. Do crop changes affect pH?
18 A. Yes, they do, particularly if nicotine content
19 is different from one crop to another because of the
20 weather, the growing practices, whatever.
21 Q. Now based on the data in this memorandum, was

22 Philip Morris increasing the smoke pH of Marlboro
23 during this period?
24 A. I'm sorry, during which period?
25 Q. The period of time since -- from '72 to '74
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10638

1 that's referenced in paragraph three.
2 A. In paragraph three it says an increase in smoke
3 pH of Marlboro was observed in 1972.
4 Q. And then with reference from '72 to '74, if you
5 look at the next paragraph.
6 A. Yes. And from '72 to '74, it says, Marlboro
7 smoke pH decreased from 6.46 to 6.30.
8 MR. CIRESI: A misreading of the document,
9 Your Honor.
10 THE COURT: Yes, that should be reread
11 correctly.
12 Q. I'll be glad --
13 I will, and I want to see if I can get it up
14 here and see what I misread, Your Honor, and I can't
15 get it on the realtime right now. Why don't I just
16 ask it since I can't get it up. I'll --
17 Does the memorandum say that there was an
18 increase in smoke pH of Marlboro observed in '72, and
19 that Marlboro smoke pH decreased from 6.46 to 6.30 in
20 '74 and has remained relatively constant since that
21 time?
22 A. That's correct, it does say that.
23 Q. Now could you go down to the last paragraph,
24 please.
25 A. Yes.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10639

1 Q. It says --
2 Now let me ask you, I want to read this and ask
3 you a question. "No definite conclusions can be
4 drawn as to the effect of tar, nicotine and pH
5 differences between Winston and Marlboro have had on
6 sales. However, the analyses suggest that Philip
7 Morris may have made changes which improved consumer
8 preference for Marlboro while the Winston remained
9 virtually unchanged. The available data are
10 consistent with this theory." And then it does --
11 Does it go on to speak about the data?
12 A. Yes, it does.
13 Q. Then I want to go down to the last line -- or
14 the last -- end of the paragraph, sentence that
15 begins "There is no indication...?"
16 A. Yes.
17 Q. "There is no indication that Philip Morris is
18 attempting to increase nicotine strength as the tar
19 delivery of Marlboro is decreased. The relative
20 decrease in nicotine delivery of Marlboro in recent
21 years has actually been greater than the tar
22 decrease. During the 1972 to '76 period the Marlboro
23 tar delivery remained relatively constant while
24 nicotine delivery decreased. As a result, the
25 tar-to-nicotine ratio of Marlboro increased."

STIREWALT & ASSOCIATES

10640

1 Is that what that memorandum found?
2 A. Yes.
3 Q. Now I want to ask you a few questions about the
4 expanded G13 process.
5 A. Yes, sir.
6 Q. And I want to start clearing up one issue at the
7 beginning. This is Exhibit 4915 that Mr. Ciresi
8 showed you yesterday. Do you remember being asked a
9 question about all the pounds of freon that were used
10 in the Reynolds processing?
11 A. I remember that. Is that in -- is that a tab --
12 Q. That should be in the plaintiffs' binders.
13 A. Okay. I'll try to read it off the screen.
14 Q. Wait, just -- it's in tab C, that binder you
15 just -- I'm sorry.
16 A. Okay.
17 THE COURT: Excuse me. Could you move that
18 over?
19 THE WITNESS: Yes, Your Honor.
20 THE COURT: I wouldn't want to miss your
21 testimony.
22 THE WITNESS: Yes, Your Honor. This one as
23 well?
24 THE COURT: No, that's fine.
25 A. Okay. I have it.

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10641

1 Q. And if you could go to the supplemental response
2 on page three.
3 A. Okay.
4 Q. Now that question didn't deal with pounds of
5 freon; did it?
6 A. No, sir.
7 Q. Did it deal with pounds of tobacco?
8 A. These --
9 This is a table of pounds of expanded tobacco as
10 a function of the year.
11 Q. All right. I just wanted to clear that up.
12 MR. CIRESI: I'm going to object to that
13 statement, Your Honor. The question was cleared up
14 yesterday.
15 THE COURT: I believe it was.
16 BY MR. WEBER:
17 Q. With respect to that G13 expanded tobacco
18 process, remember being asked some questions
19 yesterday about a -- I think it was a B.A.T document
20 that dealt with -- raised some questions about the
21 memorandum that R. J. Reynolds had supplied about
22 their research on G13 or about the processing?
23 A. Yes, sir, I remember that.
24 Q. Now during your examination with Mr. Ciresi when
25 you were discussing that, did you mention the issue

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10642

1 of the residual amount of freon that was actually in
2 the G13 process tobacco?

3 A. I believe I recall mentioning that, yes.
4 Q. And were you asked any follow-up questions about
5 that, the actual amount of freon in the tobacco?
6 A. I don't recall any follow-up.
7 Q. By the way, were any of the articles -- or
8 strike that.
9 Did he show you any of the articles where -- the
10 research articles that were cited by the B.A.T
11 memorandum?
12 A. No, sir. There were a number of articles cited.
13 I don't recall him showing me any of them.
14 Q. Did you review those cites to the B.A.T
15 memorandum last evening?
16 A. I did last night.
17 Q. How did the exposure levels in the studies cited
18 in the B.A.T memorandum relate to the levels of freon
19 in the G13 tobacco?
20 MR. CIRESI: Objection, no foundation.
21 Document's not here.
22 THE COURT: Sustained.
23 MR. WEBER: Your Honor, it's research he
24 read.
25 THE COURT: Where is the document?
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND
10643
1 MR. WEBER: We have them -- well --
2 THE COURT: He referred to a document that
3 he just read; is that right?
4 MR. WEBER: Oh, the B.A.T document, is
5 that --
6 MR. CIRESI: No.
7 THE COURT: No, the attachment. Why don't
8 you just -- why don't we just have those?
9 MR. WEBER: Well I didn't bring the
10 research with me today. He reviewed the articles
11 last night.
12 THE COURT: Well counsel --
13 MR. WEBER: If I could just make one point,
14 Your Honor. We haven't required experts to bring all
15 the research in they've relied upon.
16 MR. CIRESI: I object to the inappropriate
17 comments arguing the motion. I object, calls for
18 hearsay, no foundation.
19 THE COURT: Sustained.
20 BY MR. WEBER:
21 Q. Let's talk about the residue levels of freon
22 that are in the G13 tobacco based on the R. J.
23 Reynolds research. All right?
24 A. Yes, sir.
25 MR. CIRESI: Excuse me, Your Honor. I
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND
10644
1 would like the witness to testify to that, not
2 counsel, if you're going to write it on there.
3 MR. WEBER: I'm just going to write what
4 the testimony is, Your Honor.
5 THE COURT: Go ahead.
6 Q. Now, what is the --
7 Was there a maximum residue level established

8 for the G13 tobacco?
9 MR. CIRESI: Objection, Your Honor,
10 foundation.
11 THE COURT: You may answer that.
12 A. Yes, sir, there was a maximum residue level of
13 freon in the tobacco established at R. J. Reynolds.
14 Q. And what was that?
15 A. The maximum residue level was five micrograms
16 per cigarette.
17 Q. And is the symbol for a microgram kind of like a
18 ug?
19 A. It's a Greek letter, yes.
20 Q. Is that close enough (writing on board)?
21 A. That's good.
22 Q. Okay. Based on your review of the R. J.
23 Reynolds research, what was the actual residual level
24 of freon in the cigarettes?
25 MR. CIRESI: Objection, there's no
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10645

1 foundation.
2 THE COURT: You may answer that.
3 MR. CIRESI: What research?
4 A. There were a number of studies conducted by
5 Reynolds over the time. There was one large study in
6 the same documents about residue levels where
7 Reynolds scientists purchased commercial cigarettes
8 from the commercial market, brought those in to the
9 laboratory and measured levels, and that particular
10 study averaged 2.3 micrograms per cigarette.
11 Q. 2.3 micrograms?
12 A. Yes, sir.
13 Q. Now what was the transfer rate to smoke of the
14 freon in the tobacco?
15 A. Dr. Rodgman conducted extensive studies, he and
16 the scientists, and determined the transfer
17 efficiency of about 18 percent of the freon --
18 MR. CIRESI: Excuse me.
19 A. -- transferred to mainstream smoke.
20 MR. CIRESI: Your Honor, I'm going to
21 object to that, calls for hearsay. Move to strike.
22 THE COURT: Sustained.
23 Q. Can you turn to Exhibit 12545. I think it's tab
24 B.
25 A. Yes, sir.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10646

1 MR. WEBER: This was a document you
2 designated, Mr. Ciresi.
3 MR. CIRESI: Is it in your plaintiffs' list
4 or --
5 MR. WEBER: It's on your list.
6 MR. CIRESI: Okay.
7 Q. Could you read the title of that document.
8 A. Yes. The title is "G13-EXPANDED TOBACCO AND
9 FREON 11."
10 Q. And who's it prepared by?
11 A. The author is Alan Rodgman.
12 Q. And what's the date of it?

13 A. December 1972. There are a number of revisions
14 that --
15 Well, the original is December 1972, then
16 there's a first revision February 1974, there's a
17 second revision October 1977.
18 Q. All right. And was --
19 Is this the results of Dr. Rodgman and Reynolds'
20 testing of the G13 tobacco that you referred to?
21 A. This is a detailed summary of the -- of the
22 chemistry and biology that was conducted on tobaccos
23 that were expanded with Freon 11.
24 Q. And could you turn to the first page of that
25 exhibit with a number on it. 12545.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10647

1 MR. WEBER: May I approach, Your Honor?
2 A. You want the first --
3 Q. No, I'm sorry.
4 The date on the cover page is?
5 A. The date on the cover page of this document is
6 October 1977, I believe.
7 Q. All right. And this is the document we've been
8 speaking about?
9 A. That's correct.
10 MR. WEBER: All right. Your Honor, I'd
11 move the -- well --
12 Q. And this was created and maintained by R. J.
13 Reynolds in the regular course of its business?
14 A. That's correct. This is an R. J. Reynolds
15 report.
16 MR. WEBER: Your Honor, I'd move the
17 admission of 12545.
18 MR. CIRESI: No objection, Your Honor.
19 THE COURT: Court will receive 12545.
20 BY MR. WEBER:
21 Q. Now based upon the information in this document,
22 what was the transfer rate of the actual freon that
23 was found in the cigarettes? What was the transfer
24 rate of that smoke?
25 MR. CIRESI: May we have a page number,

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10648

1 Your Honor?
2 MR. WEBER: Your Honor, can I proceed
3 without giving the page number? I mean the
4 document's now in evidence.
5 THE COURT: Counsel, counsel, please.
6 MR. WEBER: Okay.
7 BY MR. WEBER:
8 Q. Could you turn to the Bates page 2552, Dr.
9 Townsend.
10 A. Yes, sir.
11 Q. And could you look at the second paragraph under
12 "Summary."
13 A. Yes.
14 Q. And what does it say there about the transfer
15 rate of Freon 11 from tobacco to mainstream smoke?
16 Last sentence of that paragraph.
17 A. Yes, sir, I see it. The transfer of Freon 11

18 from the cigarette tobaccos to the mainstream smoke
19 is 18 percent.
20 Q. Now applying a transfer rate of 18 percent to
21 the 2.3 --
22 Is it micrograms?
23 A. Micrograms per cigarette.
24 Q. All right. How many micrograms per cigarette
25 would there be produced in the mainstream smoke?
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND
10649
1 A. It would be approximately .4 micrograms in
2 mainstream smoke.
3 Q. So it would be less than one, less than one in
4 smoke.
5 A. Approximately .4.
6 Q. Now let me turn you now to page one of this
7 document. Actually it's -- let me give you the Bates
8 number, it's 2524.
9 A. Okay.
10 Q. And I want to read from the summary here, if I
11 could, --
12 A. All right.
13 Q. -- and ask you about it. This is a study of G13
14 and Freon 11; correct?
15 A. That's correct.
16 Q. By the way, how many bibliographic references
17 are there in this document?
18 A. 233.
19 Q. Now it says, "Extensive literature and
20 laboratory research has convinced R. J. Reynolds that
21 inclusion in its products of tobacco expanded by
22 Freon 11 in the G13 process presents no hazard to the
23 smoker." Do you see that?
24 A. Yes, sir.
25 Q. And does it go on to describe the testing and
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND
10650
1 the research that they've done?
2 A. Yes, it does. It gives a summary of the
3 chemical and biological testing.
4 Q. "This research consisted of" -- I want to ask
5 you about this language. "This research consisted of
6 a detailed ongoing examination of the published
7 literature on the biological properties of Freon 11
8 with particular emphasis on the respiratory system,
9 cardiovascular system, reproductive system, and
10 liver; extensive studies on the chemical and
11 biological properties (mouse skin-painting,
12 microphage activity suppression) of the levels (50
13 micrograms per cigarette) of residual Freon 11; and a
14 study of the biological properties (acute respiratory
15 toxicity) of smoke generated from cigarettes smoked
16 in an atmosphere of air-Freon 11" at a thousand parts
17 per million.
18 Now do you see the reference there to the
19 biological tests were performed at a rate of 50
20 micrograms per cigarette?
21 A. I see the reference, and that refers to 50
22 micrograms per cigarette residue level in the

23 products that they did that biology with.
24 Q. So if the residual -- maximum residue level was
25 five and the actual was 2.3, they did the biological
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10651

1 testing at a rate of how many?
2 A. Fifty micrograms per cigarette.
3 Q. Why would they use a larger number by that
4 multiple?
5 A. To ensure that if there's biological effects,
6 they'd see it, if possible.
7 Q. Now it goes on to say, "The results of three
8 18-month mouse skin-painting tests and an inhalation
9 test with hamsters indicate that expansion of tobacco
10 by the G13 process and the residual Freon 11 (about
11 50 micrograms per cigarette) do not alter in any way
12 the biological properties or effects of the smoke
13 condensate."
14 Is that another reference to testing at 50
15 micrograms?
16 A. Yes, sir.
17 Q. Then it goes on, "The results of a macrophage
18 activity suppression test indicate that Freon 11
19 expansion of tobacco does not substantially alter the
20 biological properties or effects of the smoke. In
21 fact, macrophages exposed to smoke from tobacco
22 expanded by the G13 process and containing 50
23 micrograms per cigarette of residual Freon 11 recover
24 their activity somewhat more rapidly than do similar
25 cells exposed to control smoke."

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10652

1 Again, are those tests that refer to this higher
2 test level of 50 micrograms?
3 A. That's correct.
4 Q. Then it goes on, "The results of an acute
5 respiratory toxicity study indicate the generation of
6 smoke by smoking a cigarette in air-Freon 11 (1000
7 parts per million) does not alter in any way the
8 biological properties or effects of smoke."
9 Then it goes on and talks about the chemical and
10 smoke analysis; does it not?
11 A. That's correct, it does.
12 Q. "No" --
13 Does it say, "No compound (other than Freon 11)
14 has been found in the smoke from G13-processed
15 tobacco containing 50 micrograms of residual Freon 11
16 per cigarette that is not present in commercial
17 cigarette smoke?"
18 A. That's correct.
19 Q. What does that mean?
20 A. That means that scientists under Dr. Rodgman's
21 direction looked at -- looked extensively at the
22 chemistry and found no new compounds that weren't
23 already present in the smoke.
24 Q. And they did those tests at 50 micrograms, too?
25 A. That's correct.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953

10653

- 1 Q. Then they went on and talked about the various
2 compounds that they researched?
3 A. Yes.
4 Q. Then it goes on and talks about, down in the
5 last few sentences, "These 234 included the
6 polycyclic hydrocarbons (some of which are alleged to
7 be carcinogenic) and the phenols (some of which are
8 alleged to be cocarcinogenic)."
9 A. That's correct.
10 Q. And those were both reduced in the G13 process;
11 correct?
12 A. That's correct, both were reduced by the
13 inclusion of G13.
14 Q. Then it goes on, "Inclusion of G13-expanded
15 tobacco in a cigarette blend is an effective way to
16 reduce the levels per cigarette of the tar and other
17 smoke components alleged to be harmful." Is that
18 what it says?
19 A. That's what it says.
20 Q. It goes "The level of Freon 11 in the mainstream
21 smoke from cigarettes containing Freon 11 at a level
22 of 5 micrograms per cigarette is too low to be
23 hazardous to the smoker. Commercial cigarettes
24 containing G13-processed tobaccos have Freon 11
25 levels less than 5 micrograms...." Do you see that?

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953

REDIRECT EXAMINATION - DAVID E. TOWNSEND

10654

- 1 A. Yes, sir.
2 Q. Then it goes on to talk about phosgene in the
3 next paragraph; correct?
4 A. That's correct.
5 Q. Why did they look for phosgene?
6 A. Well because it was theorized that phosgene
7 might be a pyrolysis product of -- of Freon 11.
8 Q. And did they perform extensive searches for
9 that?
10 A. They did. They -- they performed extensive
11 searches of cigarette smoke with F -- F11-treated
12 tobaccos or F11-expanded tobaccos, again at high
13 levels of residual freon or F11, the high levels were
14 in the range of 50 to I think as high as maybe 80
15 micrograms per cigarette. They used analytical
16 methodology that could detect phosgene in the
17 picogram range. So they not only used very high
18 residue levels, but they also used very sensitive --
19 sensitive analytical techniques to get into the
20 picogram range, which is a trillionth of a gram.
21 Q. Now --
22 And then it says, "One of the possible pyrolysis
23 products from Freon 11 in the combustion zone of a
24 burning cigarette is phosgene. A concerted effort
25 was made to detect this compound in the smoke, but

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953

REDIRECT EXAMINATION - DAVID E. TOWNSEND

10655

- 1 none was found by RJR personnel in 1970, by contract
2 laboratory personnel in 1971, or by EPA investigators
3 in 1976. Experimental evidence also contradict the

4 claims that phosgene arising by exposure of a
5 chlorofluorocarbon to a lit cigarette was the cause
6 of the Legionnaires' Disease and this evidence is
7 presented."

8 And that was another issue they looked at;
9 wasn't it?

10 A. That's correct.

11 Q. Then it goes on, "The levels of Freon 11
12 decomposition products, if any, in the mainstream
13 smoke from cigarettes containing Freon 11 at a level
14 of 50 micrograms or less per cigarette are too low to
15 be hazardous to the smoker. There is no
16 statistically significant difference (at a 95 percent
17 confidence level) between the total amount of Freon
18 11 recovered in the smoke products (mainstream,
19 sidestream, butt) and the residual amount of Freon 11
20 on the tobacco smoked."

21 Now does that mean that they did chemical tests
22 and found just as much freon came off the cigarette
23 as was in it to begin with?

24 A. That's essentially correct. What that does mean
25 is that the scientists conducted what we call a mass

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10656

1 balance study. If you know how much starts on the
2 tobacco rod, and then you analyze the mainstream
3 smoke, the sidestream smoke, the tar collected on the
4 filter, and you add up all those pieces, do you get
5 what you started? The conclusion here is that they
6 did get a mass -- a complete mass recovery at the 95
7 percent confidence level.

8 Q. And does that mean that the freon wasn't
9 reacting with anything else?

10 A. That's correct.

11 Q. And if you could turn to page number -- Bates
12 numbered 2588.

13 A. Okay.

14 Q. And does this page summarize the results of the
15 study in the search for phosgene?

16 A. Yes, sir.

17 Q. Does it note, "No phosgene has been found in the
18 mainstream smoke from Freon 11-containing cigarettes"
19 down in the middle of the paragraph?

20 A. Yes. And I believe that was by three
21 laboratories.

22 Q. And that's even with testing the cigarettes in
23 the 50- to 80-microgram range?

24 A. That's right.

25 Q. Now if you could turn in a little farther to --
STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10657

1 it looks like 2594.

2 A. Okay.

3 Q. And is that a chart showing the effects of
4 adding expanded tobacco to the blend of a cigarette?

5 A. Yes, it is. On -- on the X axis we have the
6 percent expanded incorporated into a tobacco blend
7 going from zero to a hundred percent; on the Y axis
8 we have the level or yield of a variety of smoke --

9 or tar or smoke components.
10 Q. And does it show that by using expanded tobacco,
11 tar decreases?
12 A. What it shows is that -- that there's a major
13 reduction in the tar yield or tar delivery as one
14 increases the expanded tobacco in the blend, holding
15 all other cigarette construction variables constant.
16 It also shows the nicotine has a -- an almost
17 parallel reduction, carbon monoxide is also reduced,
18 and benz -- benzpyrene is also reduced pretty much in
19 parallel to the reduction of tar.
20 Q. And just to summarize, there were a series of
21 animal inhalation experiments done?
22 A. That's correct. A number.
23 Q. And they were done at the 50-microgram level?
24 A. That's correct.
25 Q. And no differences were shown between freon G13
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10658

1 tobacco and other tobacco?
2 A. That's correct.
3 Q. And was the Reynolds reconstituted paper sheet
4 process -- strike that.
5 Was the Reynolds expanded tobacco process
6 among -- included among the different types of
7 processes analyzed by the Surgeon General in 1979?
8 A. Yes, it was.
9 Q. That was that large chart that had expanded
10 tobacco?
11 A. That was a very big chart, yes.
12 Q. And various companies had expanded tobacco at
13 that time?
14 A. That's right.
15 Q. Now you were asked some questions about the
16 National Cancer Institute's less-hazardous cigarette
17 project.
18 A. Yes, sir.
19 Q. I think that 1976 report that's in evidence,
20 GJ00277A, should be at tab D.
21 A. Okay.
22 Q. And could you turn --
23 Now that was a program that was abandoned by the
24 federal government in 1978?
25 A. The NCI Tobacco Working Group program was
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10659

1 abandoned in approximately 1978 by the -- by the U.S.
2 government.
3 Q. Could you turn to page 34 of that exhibit.
4 A. Okay.
5 Q. Does that discuss there a series of inhalation
6 experiments that were being conducted?
7 A. Yes, it does.
8 Q. Now after that program was abandoned by the
9 National Cancer Institute, were the results of any of
10 those studies ever published by the National Cancer
11 Institute?
12 A. Not to my knowledge. I don't believe these were
13 published.

14 Q. Now the --
15 Turn to Exhibit 10485, if you would, in the
16 plaintiffs' binder. The one with the numbers on it.
17 A. Okay. Okay.
18 Q. And this is a document that you were shown dated
19 May 1973. Do you remember that?
20 A. Yes.
21 Q. And you were asked some questions about
22 President Nixon and read some information here about
23 a series of politicians and things like that?
24 A. Right.
25 Q. Were you asked any questions about the opinion
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10660

1 of the head of the National Cancer Institute with
2 respect to the less-hazardous cigarette program?
3 A. Out of this document?
4 Q. Yes.
5 A. I don't recall that at all, sir.
6 Q. Could you turn to page six.
7 A. Okay.
8 Q. And I'd like to refer you to right here in the
9 second paragraph in paragraph 11, "Rauscher, as
10 Director of the National Cancer Institute, is
11 preparing national cancer plan, and since this will
12 call for vastly increased expenditure on cancer
13 research, it has to be submitted for review by the
14 Office of Management and Budget. The approval of
15 Gori's research proposals by the Ad Hoc Committee on
16 Smoking and Health, and later by the National Cancer
17 Advisory Board, presumably means only that these
18 proposals (or those that relate to cancer) will be
19 included in Rauscher's national cancer plan."
20 I want you to go down to paragraph 12 now. And
21 speaking of the head of the National Cancer
22 Institute, it says, "Rauscher himself looks forward
23 to a 'safer' cigarette. Speaking recently at the
24 26th annual dinner of the James Ewing Society at the
25 University of Louisville, Kentucky, Rauscher said
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10661

1 that a much less hazardous cigarette should be on the
2 market within five years. 'This cigarette probably
3 will be made from tobacco which has been modified.
4 There may be a different fertilizer used to grow the
5 tobacco plant, and some chemicals now in the finished
6 product may be eliminated.'" Do you see that?
7 A. Yes, I do.
8 Q. Now it wasn't just Dr. Gori in this time period
9 who was interested in the less-hazardous cigarette
10 movement; was it?
11 A. No. There were a number of scientists and a
12 variety of people.
13 Q. And Dr. Gori had been a long-time NCI employee;
14 had he not?
15 A. I believe so.
16 Q. Did he believe that industry -- that is, the
17 tobacco industry -- and the government should
18 cooperate with respect to the less-hazardous

19 cigarette movement?
20 MR. CIRESI: Your Honor, I haven't objected
21 on leading, but every question --
22 I'm just going to object. Leading and
23 suggestive.
24 THE COURT: Counsel, you'll have to let the
25 witness testify, please.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10662

1 MR. WEBER: All right.
2 BY MR. WEBER:
3 Q. Do you know what Dr. Gori --
4 From the readings of the Tobacco Working Group
5 materials, the formal minutes, the reports, et
6 cetera, did Dr. Gori express in there whether the
7 tobacco industry should cooperate with the government
8 and the government should cooperate with tobacco
9 industry on safer, less -- less-hazardous cigarette
10 issues?
11 THE COURT: Counsel --
12 MR. CIRESI: Objection, calls for hearsay,
13 and it's leading.
14 THE COURT: Counsel, you're leading your
15 witness.
16 MR. WEBER: Okay.
17 THE COURT: You'll have to rephrase your
18 question.
19 BY MR. WEBER:
20 Q. What do you know, if anything, from your review
21 of the Tobacco Working Group documents, regarding Dr.
22 Gori's attitude toward issues of cooperation between
23 government and industry? What do you know about
24 that?
25 A. In -- in a large number of the minutes of

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10663

1 Tobacco Working Group there are clear references from
2 Dr. Gori and some discussion about the -- the goals
3 of -- of developing reduced-risk cigarettes and how
4 industry, universities, including USDA, including Oak
5 Ridge National Laboratory, the University of
6 Kentucky, and the industry need to work together to
7 accomplish this.
8 MR. CIRESI: Objection, Your Honor, it's
9 hearsay. Move to strike.
10 THE COURT: Well it is hearsay, but I'll
11 let it stand.
12 BY MR. WEBER:
13 Q. I want to talk about the issue of mutagenicity
14 for a moment.
15 A. Yes, sir.
16 Q. There were a series of documents about RJR's
17 doing Ames testing?
18 A. Yes.
19 Q. Why does RJR do Ames testing?
20 A. Well it's one biological assay that we use as a
21 screening tool. We have a number of biological
22 assays that have different end points. We also
23 talked this morning about a variety of genotoxicity

24 tests. There was one document that I was asked about
25 that described several, including Ames tests. But
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10664

1 certainly Ames testing is a screening test, not
2 really definitive.

3 What we do at Reynolds is we conduct a number of
4 different types of biological tests as well as
5 chemical tests. We pull all the information together
6 to make judgments about -- and -- and come to some
7 conclusion on the bulk of the evidence because no one
8 biological test, to my understanding, is really
9 definitive.

10 Q. Now does reaction on the Ames test equate to
11 carcinogenic potential?

12 A. No, it doesn't. There are really two different
13 tests. Ames mutagenicity measures changes in genetic
14 material, as we talked about this morning. Mouse
15 skin-painting tumorigenicity, of course, is -- is
16 actually long-term exposure on mouse skin to
17 cigarette smoke condensate and then seeing the
18 development of tumors at those high concentrations of
19 exposure. There really are two different measures,
20 and in many cases, but not always, the -- the results
21 of those -- those two assays sometimes go in opposite
22 directions, sometimes they move together with certain
23 changes in cigarette design, and both may go down.

24 But from the Tobacco Working Group, the NCI,
25 National Cancer Institute Tobacco Working Group,

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10665

1 there were a number of design changes that showed
2 reduction in mouse skin-painting tumorigenicity but
3 also showed an increase in Ames mutagenicity. So
4 some of these biological tests go in different
5 directions, and biologists and toxicologists really
6 need to look at all the evidence together from a
7 variety of different tests.

8 One example where there was that crossover was
9 in fact air-diluted filters. Air dilution does
10 increase Ames -- specific Ames mutagenic activity on
11 a per milligram basis, not on a per cigarette basis
12 as I've already said this morning. But on a per
13 milligram basis it does increase the Ames mutagenic
14 activity, but the mouse skin-painting results from
15 the NCI TWG research went down.

16 Q. Now another question, series of questions you
17 were asked were a series asked of -- relating to
18 statements in the 1981 Surgeon General's report about
19 cigarette ingredients and the possible effects of
20 whether those ingredients had altered tar. Do you
21 remember that?

22 A. Right, I do remember that.

23 Q. And there were quotes about the need for
24 research with respect to ingredients?

25 A. Yes.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

1 Q. Does RJR do research on its ingredients?
2 A. Yes, we do extensive research on ingredients.
3 Q. Now with respect to the 1981 Surgeon General's
4 report, did Mr. Ciresi show you the statement in the
5 1981 Surgeon General's report that dealt specifically
6 with the issue of comparing tar from older cigarettes
7 to tar from more modern cigarettes?
8 A. No, sir, we did not look at that.
9 Q. Would a comparison of that type be of relevance
10 in determining whether or not the tar had changed?
11 A. I think it's directly -- directly relevant.
12 Q. Could you turn to the 1981 Surgeon General's
13 report at page 18.
14 A. Okay.
15 Q. And does that say down at the bottom, in
16 paragraph number eight, "The 'tar' condensate -- The
17 'tar' content of smoke condensate of today's
18 cigarette is less tumorigenic to mouse skin than that
19 of cigarettes of 30 years ago. Levels of the
20 carcinogen benzpyrene are lower in the smoke of
21 today's cigarettes than in that of cigarettes of 30
22 years ago. Flavor additives used in lower 'tar' and
23 nicotine cigarettes produce traces of mutagenic
24 compounds."
25 Is that what the Surgeon General said with
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

1 respect to comparing tar from the former type of
2 cigarette to tar from the modern cigarette?
3 A. Yes, the Surgeon General did say that.
4 Q. Now on the FTC test method, let -- let me ask
5 you this: Is that the FTC test method or is that an
6 R. J. Reynolds test method?
7 A. The FTC established the FTC test method.
8 Q. Wasn't the tobacco industry.
9 A. The tobacco industry provided some information,
10 and the FTC, of course, looked at the published
11 literature. There was some information about how to
12 construct smoking machines that was, of course,
13 provided to the FTC, there was some cooperation at
14 that time. But the FTC defined what the FTC test
15 method would be, should be, and then they established
16 that.
17 Q. What did R. J. Reynolds have to say to the FTC
18 at the time it adopted its test method?
19 A. R. J. -- R. J. Reynolds did inform FTC at the
20 time that the machine laboratory smoking method would
21 not reflect what any individual smoker would get.
22 Q. And as you understand that test, what's the
23 purpose of it? Is it supposed to show what any
24 individual smoker will get?
25 A. The FTC has made it very clear. At the
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

1 introduction of the FTC test method in 1967, the FTC
2 commissioner said that this method was never intended
3 to represent what any individual smoker gets, it was
4 intended to provide a comparison for smokers to make

5 choices in the marketplace. FTC commissioners at
6 various points since 1967 have reaffirmed that.
7 Q. And is that the same position that we -- that
8 you explained to the ladies and gentlemen of the jury
9 from the Froggatt information in England in 1988 with
10 respect to standard testing?

11 A. Yes.

12 MR. CIRESI: Your Honor -- excuse me.
13 Again, he's leading, he's calling for hearsay.

14 THE COURT: Sustained.

15 BY MR. WEBER:

16 Q. With respect to the 1988 report of the -- of
17 Britain's Independent Committee on Smoking and Health
18 that's in evidence from the Froggatt Committee, can
19 you compare the position the Froggatt Committee took
20 on standardized testing to the one you just
21 expressed?

22 A. Froggatt's --

23 MR. CIRESI: Excuse me, doctor. Excuse me.
24 It's irrelevant what the Froggatt Committee did in
25 England.

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10669

1 THE COURT: He can answer.

2 A. Peter -- Peter Froggatt and his Independent
3 scientific Commission on Smoking and Health did make
4 a number of statements in the '88 report that made it
5 clear that -- that laboratory machine smoking cannot
6 and is not intended to represent what smokers
7 actually get.

8 Q. Can you turn to page 49 of the '81 report, and I
9 want to ask you this question. Mr. Ciresi asked you
10 about smoking machines that mimic human smoking. Do
11 you remember that?

12 A. Yes.

13 Q. And how Reynolds was, I think, in 1983, doing
14 some work with such machines?

15 A. That's right, with what we call a human mimic
16 smoking machine.

17 Q. All right. Could you turn to page 49, and I
18 want to read you this --

19 A. All right.

20 Q. -- from the Surgeon General's report in 1981.

21 A. Okay. I'm there.

22 Q. "Cigarette smoking-machines can be designed,
23 however, to control puff volume, frequency of
24 puffing, duration of puff, the profile of puff
25 pressure over time, butt length, position of

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10670

1 cigarette during and between puffs (e.g., horizontal
2 or vertical) and restricted or free smoking between
3 puffs (i.e., whether the butt end is closed or open).
4 The puff volume can be measured in terms of the air
5 entering the cigarette or the air plus combustion
6 gases leaving the cigarette. Smoking machines could
7 be designed to change the puff frequency and the
8 nature of the puffs during the course of smoking a
9 single cigarette." Do you see that?

10 A. Yes.
11 Q. Does that refer to the type of machine that was
12 referenced earlier?
13 A. Certainly does.
14 Q. Then it goes on to say "Human smoking patterns
15 are diverse and span a wide range from one individual
16 to another." Do you see that?
17 A. Yes.
18 Q. And is that consistent or inconsistent with the
19 point you've expressed a number of times today?
20 A. Well it's completely consistent.
21 Q. Now there were some questions asked about
22 compensation. Do you remember that?
23 A. Yes.
24 Q. And on page 113, I'll show this to you, just
25 want to refer to it quickly, of the National Cancer
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10671

1 Institute's FTC report, Mr. Ciresi asked you a couple
2 questions. I'll get that out. Do you remember he
3 asked you some questions about the article by
4 Henningfield and Smith?
5 A. Yes.
6 Q. And do you remember he read right through this
7 area in this paragraph and asked -- read this
8 sentence that begins "Cigarette smoking behavior is
9 influenced by nicotine dose" --
10 A. Yes.
11 Q. -- "and smokers tend to maintain nicotine intake
12 within an upper and lower boundary."
13 A. Right.
14 Q. Did he read the word Kozlowski, did he read the
15 cite to Kozlowski?
16 A. I don't recall him reading the cite to
17 Kozlowski. I think I may have mentioned it in -- in
18 an answer to that question or maybe to a later
19 question.
20 Q. You mentioned Kozlowski; correct?
21 A. That's -- that's correct.
22 Q. Could you turn to tab G, which is GK000555, and
23 that's the in evidence -- that's the report of
24 Canada's Expert Committee on Cigarette Modification.
25 A. Okay, I'm there.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10672

1 Q. Now could you turn to page 56, please.
2 A. Okay.
3 Q. And is --
4 On 56, is there a presentation by Dr. Kozlowski?
5 A. There is. Dr. Lynn Kozlowski gave a
6 presentation at Canada's Expert Committee on -- in
7 the -- in the area of smoking behavior and
8 compensation.
9 Q. Now Dr. Kozlowski believes that -- strongly --
10 that cigarette smoking is addictive; doesn't he?
11 A. Absolutely.
12 Q. Now --
13 And did Dr. Kozlowski prepare for the Canadian
14 Expert Committee on Cigarette Modification a chart

15 about compensation?
16 A. I'm sorry. Can you ask that question again?
17 Q. Did he prepare a chart about compensation for
18 this committee?
19 A. He did, and it's included in the expert report.
20 Q. Is that what is on the screen right now?
21 A. Yes, sir.
22 Q. Now if you would look at .7 milligrams of
23 nicotine, where I've drawn that line. All right?
24 A. Right.
25 Q. To 1.2 milligrams of nicotine where I've drawn

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10673

1 that other line. Do you see that?
2 A. Yes.
3 Q. What percentage of the U.S. cigarette market by
4 volume, roughly, is in that .7 to 1.2?
5 A. I can give you an estimate because that's in the
6 full flavor low tar range. The full flavor low tar
7 range in fact is the largest range in the U.S. market
8 with -- the largest category in the U.S. market, and
9 it's somewhere in the neighborhood of around 40 to 45
10 percent of the U.S. market, I believe.
11 Q. And in that area of the market, according to Dr.
12 Kozlowski's chart, compensation behavior would go
13 from a maximum of about 40 percent, roughly, almost
14 to baseline; is that what that shows?
15 A. Dr. Kozlowski's chart would show that over that
16 range of nicotine yield from cigarettes, compensation
17 would be maximum about 40 percent and would decline
18 down to about zero at 1.2 milligrams nicotine
19 delivery.
20 Q. And at the bottom of this chart, I want to show
21 some language from Dr. Kozlowski to the Canadian
22 Expert Committee, says, "The line in the above figure
23 indicates the extent of compensation. When you get
24 to lower nicotine yields, there is evidence for
25 greater compensation. The evidence does not suggest

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10674

1 a 100 percent compensation at any level." Do you see
2 that?
3 A. Yes.
4 Q. And is that consistent with what you -- the
5 testimony you've given over the past few days?
6 A. Yes, it is consistent with what I said several
7 times.
8 Q. Now I want to refer you to Exhibit 13139.
9 A. Is that in plaintiffs' book?
10 Q. Yes.
11 A. Okay.
12 Q. And is that a document that Mr. Ciresi asked you
13 some questions about earlier?
14 A. Yes. I was asked some questions about this
15 document.
16 Q. And if I remember, were you asked questions
17 about the part of the memorandum that talked about an
18 argument that could be constructed?
19 A. Yes, sir.

20 Q. And that said you could argue that ULT
21 advertising is misleading?
22 A. That was --
23 Q. Was that the area he was asking you about?
24 A. That was the area of the question.
25 Q. Did he ask you about the conclusions at the last
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10675

1 page?
2 A. I don't recall a question on the conclusions of
3 the last page.
4 Q. That would be 8016. It's the last page of --
5 A. Yes.
6 Q. -- that series of text.
7 A. I'm there.
8 Q. Okay. Does that say, "The results of both these
9 studies are consistent with the propositions that:
10 "Smokers of low yield cigarettes adjust their
11 smoking behavior to obtain some desired level of
12 nicotine and therefore concomitantly increase their
13 tar intake."
14 Then it goes on, "The somewhat lower
15 tar-to-nicotine ratio of low yield cigarettes insures
16 a lower tar intake in a smoker who switches to lower
17 tar cigarettes even if he adjusts his smoking
18 maneuver to obtain more nicotine." Is that what that
19 says?
20 A. Well that's what it says. You -- you changed
21 "behavior" -- or you changed the first "maneuver" in
22 the first line to the word "behavior."
23 Q. Oh, I'm sorry.
24 A. Other than that you read it accurately.
25 Q. Okay. Now you were also asked some questions
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10676

1 about DrRussell --
2 A. Yes.
3 Q. -- and what his current views were, what his
4 views were over the years?
5 A. Right.
6 Q. Remember that?
7 A. Yes.
8 Q. Could you turn to tab N. I'm sorry, that's
9 AZ001024.
10 A. Okay.
11 Q. And is that a reprint from Rehabilitation of
12 articles from the Second European Council, Smoking
13 and Society in 1979?
14 A. Yes.
15 Q. And on --
16 Does it have Dr. Russell's remarks or article at
17 page 41 and 42?
18 A. It does, at the bottom of 41, continuing on
19 through 42.
20 Q. And is this a document that you rely on with
21 respect to cigarette design issues --
22 A. Yes.
23 Q. -- as regards the Russell hypothesis that you've
24 spoken about a number of times on both direct and

25 cross?

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10677

1 A. Exactly.

2 MR. WEBER: Your Honor, I'd move AZ001024
3 under 803(16).

4 MR. CIRESI: I have no objection, Your
5 Honor.

6 THE COURT: Court will receive AZ001024.
7 BY MR. WEBER:

8 Q. And here doctor, let's start at the bottom of
9 this page, see what Dr. Russell has to say. "There
10 is no question that the best way to prevent diseases
11 due to smoking is to prevent people from smoking,
12 preferably by never starting but failing this by
13 giving it up as early as possible. Unfortunately,
14 for many complex reasons, this ideal goal is a long
15 way off. For the past 25 years all kinds of
16 anti-smoking measures have been tried - campaigns on
17 radio, television and in newspapers; education
18 programmes in schools; treatment clinics.
19 Advertising of cigarettes has been banned on
20 television in some countries and banned altogether in
21 others. Health warnings have been printed on
22 cigarette packets, and most countries have imposed
23 restrictions on smoking in certain public places.
24 All this has achieved very little. 19 million people
25 in Britain still smoke. Almost 60 million Americans

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10678

1 still smoke.

2 "What is to be done? I think we need a new
3 approach. It is not simply enough -- it is not
4 enough simply to continue to use the same old
5 anti-smoking campaigns, even if they are intensified
6 and better coordinated. I think we should put more
7 effort into the development and promotion of safer
8 cigarettes, and give this high priority.

9 "Why has the anti-smoking approach failed?
10 Because smoking is such a powerful addiction. Why is
11 it so addictive? There are many factors but the
12 prime factor is nicotine, and the modern cigarette is
13 a highly efficient device for getting nicotine into
14 the brain. Most cigarettes are in essence
15 nicotine -- most smokers are in essence nicotine
16 addicts."

17 And that's been Dr. Russell's position for
18 years; correct?

19 A. That's correct.

20 Q. Then he goes on, "At the risk of being hounded
21 out of the conference I am going to suggest that over
22 the past 20 years the tobacco industry may have
23 achieved more in reducing smoking-rerelated disease
24 than we have. This is because they have focused
25 their efforts on making cigarettes safer. There have

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10679

1 been 3 very important changes in the design of
2 cigarettes."
3 The switch to filters is the first one he
4 mentions; the use of reconstituted sheet and other
5 changes in processing he mentions in two, and says
6 it's reduced the carcinogenicity of the tar weight
7 for weight so that the same amount of tar is now less
8 harmful than it was 20 years ago; and then he refers
9 to ventilated filters; is that correct?
10 A. That's correct.
11 Q. Then he goes down at the bottom to the Russell
12 hypothesis. Remember Mr. Ciresi asked you whether
13 Russell recommended low tar/low nicotine cigarettes?
14 A. Yes, sir, I remember that.
15 Q. Doesn't he say here, "A better approach may be
16 to develop low-tar, medium-nicotine cigarettes?"
17 A. That's correct.
18 Q. Then he goes on several sentences later to say,
19 "There is not much sense in a safer cigarette which
20 no one will smoke;" is that right?
21 A. That's correct.
22 Q. Now did Dr. Russell express that opinion a
23 number of times after that point?
24 A. Yes.
25 Q. Did Dr. Russell --

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10680

1 What was his opinion with respect to Premier?
2 A. Ah --
3 MR. CIRESI: Objection, Your Honor, calls
4 for hearsay.
5 THE COURT: Sustained.
6 BY MR. WEBER:
7 Q. Could you turn to tab J.
8 A. Yes.
9 Q. That's Trial Exhibit 13217.
10 A. Okay.
11 MR. WEBER: That was not designated, Your
12 Honor. It's one of plaintiffs' trial exhibits in
13 response to the issues that arose. I want to hand
14 one to Mr. Ciresi.
15 MR. CIRESI: When did the issue arise,
16 yesterday?
17 MR. WEBER: This issue?
18 MR. CIRESI: Yes.
19 MR. WEBER: I got this this morning.
20 MR. CIRESI: No. When did the issue arise?
21 MR. WEBER: Well the -- it arose yesterday
22 with Dr. Russell.
23 MR. CIRESI: Then we should have gotten
24 notice last night if they intended to use this, Your
25 Honor. I'm not going to object, but the rule is is

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10681

1 that if it comes in the day before, you give the
2 notice the next night, not the day that you're going
3 to use it.
4 THE COURT: That is the rule, counsel, but
5 go ahead.

6 MR. CIRESI: If I may look at it, Your
7 Honor.
8 BY MR. WEBER:
9 Q. Is Exhibit 13217 a letter from the files of R.
10 J. Reynolds that was sent to it by Dr. Russell?
11 A. Yes, it is. It was a letter from Dr. Mike
12 Russell to Dr. Carl Ehmann.
13 MR. CIRESI: Your Honor, this is a document
14 that they objected to on foundation. We're going to
15 object to it on hearsay grounds.
16 MR. WEBER: My only response on the hearsay
17 issue, Your Honor, is --
18 THE COURT: Well address the foundation
19 first, counsel.
20 MR. WEBER: Well I -- if it was -- if --
21 Was there foundation objection?
22 MR. CIRESI: Yes, sir.
23 MR. WEBER: All right. I withdraw the
24 proffer, Your Honor.
25 BY MR. WEBER:

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10682

1 Q. Now do you remember some questions being asked
2 to you about whether or not there should have been
3 epidemiologic studies done before the Vantage
4 cigarette went out on the market?
5 A. I remember questions along those lines.
6 Q. Now when did a filter go on Winston?
7 A. Winston was first introduced in 1954 with a
8 filter.
9 Q. And if Reynolds had waited 10, 20, 30 years for
10 epidemiologic studies before it went to filter -- put
11 the filter on, would consumers have had a choice to
12 smoke filters in the meantime?
13 MR. CIRESI: Objection, it's irrelevant.
14 THE COURT: He can answer it.
15 A. Well first of all in answering your question,
16 it's hard for me to imagine doing an epidemiological
17 test in 10 years on these chronic diseases --
18 diseases.
19 MR. CIRESI: Your Honor, I'm going to
20 object to the non-responsive answer.
21 THE COURT: It is non-responsive to the
22 question.
23 BY MR. WEBER:
24 Q. If it had taken 10, 20, 30 years to do
25 epidemiologic studies before filters were put on,

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10683

1 would that have meant that non-filter cigarettes
2 stayed a larger percentage of market for a longer
3 time?
4 MR. CIRESI: Objection, leading and
5 suggestive, Your Honor.
6 THE COURT: That is leading, but I'll allow
7 it.
8 A. Yes. If those epidemiological studies were
9 conducted before filters were placed on cigarettes,
10 then there would have been a delay of 10, 20, 30

11 years, how many ever years it took to do that
12 epidemiological study, before they were introduced in
13 the market, so non-filters would have -- would have
14 stayed the predominant cigarettes in the market.
15 Q. Was that very issue discussed in the expert
16 report of Canada's Expert Committee on cigarette
17 design?
18 A. Yes, it was.
19 Q. And what was the conclusion?
20 A. The conclusion was that -- that there was major
21 progress in implementing those filtered products in
22 the marketplace, and the epidemiology has shown
23 reduction between filtered cigarettes and
24 non-filtered cigarettes, reduction in lung cancer
25 risk.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10684

1 Q. Now could you turn back to the Canadian report,
2 GK000555.
3 A. What tab is that? I'm sorry.
4 Q. G.
5 A. Okay. Okay.
6 Q. And turn to page 17, please. And is that the
7 part of the presentation by Dr. Petitti?
8 A. Yes, that is the presentation -- this is a
9 summary of the presentation by Dr. Petitti.
10 Q. And has Dr. Petitti had a role in Surgeon
11 General reports?
12 A. Yes, sir.
13 Q. Now on the issue of the effect of lower delivery
14 cigarettes, let me read this, second paragraph. "The
15 data fairly consistently show that for long-term
16 non-filter versus long-term filter cigarette smokers,
17 there is a reduction in risk of lung cancer. The
18 best study, looking not at filter versus non-filter,
19 but at high, medium and low tar cigarettes for lung
20 cancer is the Hammond study. For low yield
21 cigarettes there is perhaps as much as a 20 percent
22 reduction in risk. These data are fairly consistent
23 across studies, across time lines and across
24 settings. I believe that these data, taken from
25 cohort and case-control studies are the most relevant

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10685

1 to the question of what are the health effects of low
2 yield cigarettes."
3 Then she goes on, "Subsequent studies, including
4 one of my own studies," this paragraph here, "have
5 compared low tar, low yield, with high yield
6 cigarettes where 'yield' is defined as a combination
7 of tar and nicotine, since the number of people who
8 smoke high tar/low nicotine is so small you can't
9 separate those effects. And here you would again
10 conclude there is very little difference from the
11 body of literature -- there is very little evidence
12 from the body of literature that there is any
13 reduction in the risk of cardiovascular disease from
14 smoking low yield cigarettes."
15 And the cardiovascular disease evidence is

16 different from the lung cancer evidence; is it not?
17 A. Certainly is.
18 Q. Now, could you turn to page 62 -- well strike
19 that.
20 Now what year was this when the Canadian Expert
21 Committee met?
22 A. This was 1996.
23 Q. Could you turn to Exhibit 12505. And is that
24 the -- a September 8, 1980 document of Dr. Alan
25 Rodgman that correlates -- that talked about how
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10686

1 Winston pH had achieved parity with Marlboro pH in
2 1980?
3 A. Yes, that is the Alan Rodgman memo to Dr. Morse
4 that discussed that.
5 Q. And do you remember Mr. Ciresi showed you some
6 of the charts on that one --
7 A. Yes.
8 Q. -- that showed that --
9 These haven't shown up very well on here for
10 anyone, but just to refresh everyone, those charts
11 showed that the pH of each was 6.4?
12 A. Yes.
13 Q. Now with respect to the data the year --
14 That's a 1980 memorandum; correct?
15 A. It's 1980.
16 Q. With respect to 1980, did you go back and look
17 at the pH testing data points for Winston?
18 A. I did. A while back I went back to the
19 competitive brands database and checked the pH data
20 that was available for Winston in the year 1980.
21 Q. And what was the highest registered pH on any of
22 the tests during 1980?
23 MR. CIRESI: Objection, no foundation.
24 THE COURT: Okay. You'll have to lay
25 foundation.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10687

1 BY MR. WEBER:
2 Q. Did you go back, as you just said, doctor, and
3 review the data that was created at the time in -- in
4 1980 testing the pH of the Winston cigarette?
5 A. Yes, sir, I did.
6 Q. And you reviewed that yourself.
7 A. Yes.
8 Q. Was that --
9 Was that one of the years you reviewed
10 specifically?
11 A. That's one of the years I reviewed specifically.
12 There were others.
13 Q. For Winston in particular.
14 A. For Winston.
15 Q. What was the highest registered pH for Winston
16 in 1980?
17 MR. CIRESI: There's still no foundation,
18 Your Honor. We don't know which documents. Was it
19 an average? I have no idea what -- what foundation
20 he's using to say he remembers something from 1994.

21 MR. WEBER: Your Honor, he just -- I said
22 he -- if I might.

23 THE COURT: Go ahead.

24 MR. WEBER: He said he looked at the data,
25 at the data that was collected in 1980.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10688

1 THE COURT: Do we know what data we're
2 talking about?

3 MR. WEBER: Yeah. He said the
4 competitive -- what -- what was the word you used,
5 sir?

6 THE WITNESS: Competitive brands database.

7 MR. WEBER: The competitive brands
8 database. He reviewed the data. And I asked him
9 what the highest was, not what the average was, and
10 I'll get to that.

11 MR. CIRESI: I object on best evidence.
12 Best evidence is the documents themselves.

13 THE COURT: Is this the Black Book?

14 MR. WEBER: Well it's among --
15 It's data that was in the -- also in a Black
16 Book and also elsewhere. It's data that's on those
17 charts.

18 THE COURT: All right. Go ahead.
19 BY MR. WEBER:

20 Q. What was the highest pH in the year of 1980 from
21 Winston on the test results?

22 A. The highest pH reported for Winston in 1980 was
23 6.4.

24 Q. What was the average, if you averaged all of the
25 different measurements for 1980 that were recorded?

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
REDIRECT EXAMINATION - DAVID E. TOWNSEND

10689

1 A. For all the data recorded in 1980 under the
2 competitive brands program, the average was 6.1.

3 Q. Now I want you to --

4 So if I understand it, then, the data point
5 referenced in Dr. Rodgman's data was the highest
6 reported during the year?

7 MR. CIRESI: Well objection, Your Honor,
8 that's leading, it's suggestive.

9 MR. WEBER: What --

10 MR. CIRESI: There's no foundation for that
11 statement.

12 THE COURT: It is --

13 MR. CIRESI: And all we have is this
14 witness's testimony regarding a document that they
15 have not produced in court today.

16 MR. WEBER: Well that's not true, Your
17 Honor, those documents have been produced.

18 THE COURT: Can we refer to them then? Can
19 we -- can you give me the number?

20 MR. WEBER: Well I don't have the documents
21 as exhibits. They've been produced.

22 MR. CIRESI: I said "in court today."

23 MR. WEBER: Oh, I'm sorry. Then I
24 misheard.

25 BY MR. WEBER:

10690

1 Q. Now let's talk about the pH method for a moment.
2 Is there one method that was used during the period
3 when Reynolds was doing its competitive brand
4 analysis more regularly than the others?

5 A. The method that's been used most often for the
6 longest period of time throughout the competitive
7 brand analysis program was what we call the -- the
8 water trap method.

9 Q. Now did the water trap method --

10 MR. CIRESI: Excuse me, counsel. I'm
11 sorry. But Your Honor, he testified he didn't know
12 which ones were used for which tests on examination.
13 I'm going to object to this as no foundation.

14 THE COURT: Sustained.

15 MR. WEBER: Your Honor, his testimony was
16 he didn't know for any one data point what test was
17 used, and he didn't. I'm just having him describe
18 the tests now. I'm not going to relate it to any
19 specific data point.

20 MR. CIRESI: And he doesn't know which one
21 was used for which test. I asked him specifically
22 the data points and every test in the data point.

23 THE COURT: Okay. He can testify as to
24 which tests are there and available, certainly cannot
25 testify as to which tests were used for which data

10691

1 point.

2 MR. WEBER: Exactly.

3 THE COURT: But I don't think that question
4 required that.

5 MR. WEBER: Right. I didn't mean it --
6 mean it to, Your Honor. Thank you.

7 THE COURT: Okay. Go ahead.

8 BY MR. WEBER:

9 Q. Now could you explain the method -- that method
10 for testing pH that you just referred to.

11 A. Yes. The method, water trap method, is actually
12 quite simple. We have looked -- or used other
13 methods in the past, but the water trap method was
14 the one we've used for the longest period of time.

15 Essentially in that method a smoking machine
16 will take a puff on a cigarette, take all puffs on
17 the cigarette, and instead of having a Cambridge
18 filter pad that traps the particulates, the whole
19 smoke, both the particulates and the gas phase, are
20 sent directly into a glass impinger trap that's
21 filled with water. The impinger trap is -- is
22 essentially a long glass tube. It has a center tube
23 down the -- down -- well tube down the center all the
24 way to the bottom. The smoke goes down that tube and
25 then bubbles out in small bubbles into the water

10692

1 solution. As the bubbles come up through the water

2 solution, tar and nicotine are very, very efficiently
3 trapped by that water solution.

4 We've also conducted control experiments where
5 we put traps on the outlet of that little impinger to
6 make sure we trap all the nicotine, and in fact we
7 find all the nicotine -- virtually all the nicotine
8 is trapped in that water trap.

9 Q. So it's not just the particulate matter that's
10 tested in that; is that correct?

11 A. It's not just the particulate matter, it's both
12 the particulate and the gas phase that's soluble in
13 water. And it turns out that nicotine is extremely
14 soluble in water under those conditions of -- of
15 bubbling.

16 And then once that solution has the whole smoke
17 in it, then we take that liquid and place a pH
18 electrode into it and measure the pH reading. So
19 that's simply the method -- the method.

20 Q. Now what does the data show, based on the R. J.
21 Reynolds testing that we showed the ladies and
22 gentlemen of the jury the other day, with respect to
23 pH of Reynolds cigarettes over time, let's say from
24 the late '70s up to 1994? Has there been a
25 consistent increase --

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953

REDIRECT EXAMINATION - DAVID E. TOWNSEND

10693

1 MR. CIRESI: Well objection, Your Honor,
2 there's no foundation, and it's leading.

3 THE COURT: It is leading, counsel.

4 Q. Based on --

5 There have been a number of questions about pH.

6 A. Yes.

7 Q. Based on the data that you presented to the
8 ladies and gentlemen of the jury the other day,
9 what's your observation as to whether Reynolds --
10 what Reynolds has done to the average pH of its
11 cigarettes over time?

12 MR. CIRESI: Objection, no foundation.

13 THE COURT: Sustained.

14 Q. Could you turn to tab 98, which is GK100345.

15 A. Yes.

16 Q. And is that the Rickert report for the state of
17 Massachusetts?

18 A. It is Rickert's report from Labstat,
19 Incorporated to the Commonwealth of Massachusetts.

20 Q. And that was the report that reported pH for a
21 number of different brands that they bought on the
22 market?

23 A. Yes.

24 Q. And I turned the flip chart back to the page it
25 was on because this was the source, if you'll

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953

REDIRECT EXAMINATION - DAVID E. TOWNSEND

10694

1 remember, for the Camel Filter pH number for 1997 of
2 5.998. Remember that?

3 A. Yes, I do.

4 Q. And we wrote that here. Do you remember?

5 A. Right.

6 Q. And then there was also a 6.19 for Camel Filter

7 that came from 1974. See that here, Dr. Townsend?
8 A. Right. I remember that.
9 Q. All right. So has the pH of Camel Filter
10 decreased over the past 20 years on average?
11 MR. CIRESI: Again, Your Honor, there's no
12 foundation for that, and it's also leading and
13 suggestive. It doesn't say what was going on over
14 the course of the years.
15 THE COURT: You'll have to lay more
16 foundation for that last question.
17 BY MR. WEBER:
18 Q. Based upon the review of the data that you and
19 your staff did and the charts you presented to the
20 ladies and gentlemen of the jury, and the data that's
21 now on the screen, the testing from the Department of
22 Massachusetts -- for the Health Department of
23 Massachusetts, do you know whether or not the pH of
24 Reynolds cigarettes has on average increased, stayed
25 the same, decreased?

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
RE-CROSS-EXAMINATION - DAVID E. TOWNSEND

10695

1 MR. CIRESI: No foundation, Your Honor.
2 It's the same question.
3 THE COURT: I'll allow that.
4 A. I do know, and it's my conclusion that the pH
5 has not increased, it's remained about the same,
6 bounced around a little bit because there's some
7 variability both in the cigarettes and in the test
8 method, but overall the pH hasn't increased.
9 MR. WEBER: Okay. Thank you, doctor, I've
10 got no further questions.

11 RE-CROSS EXAMINATION
12 BY MR. CIRESI:

13 Q. Now doctor, can you go to Exhibit 11244.
14 A. All right.
15 Q. Do you recall that's the B.A.T document
16 regarding the Freon 11?
17 A. I recall this document.
18 Q. And can you turn to page eight.
19 A. All right.
20 Q. Now you said that there was a specification of
21 five parts per million in the Reynolds reports?
22 A. There's a maximum residue level of freon in
23 tobacco of five micrograms per cigarette.
24 Q. That's a specification; correct?
25 A. It is a maximum level -- maximum residue level

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
RE-CROSS-EXAMINATION - DAVID E. TOWNSEND

10696

1 specification.
2 Q. And that relates to processed tobacco and not
3 the final cigarettes; correct?
4 A. It -- it is actually a maximum residue of five
5 micrograms per cigarette.
6 Q. Well let's see what B.A.T said about that. "It
7 must be emphasized that this level relates to
8 processed" --
9 A. Sir, excuse me. Where are you?
10 Q. Last page, right up -- paragraph eight under
11 "RESIDUE LEVELS ACHIEVED IN PRACTICE."

12 A. Okay. Do you see that?
13 A. Yes.
14 Q. "It must be emphasized that this level relates
15 to processed tobacco and not the final cigarettes.
16 Throughout the Reynolds' reports it is assumed that
17 the residual level of marketed cigarettes is 5 parts
18 per million." Do you see that?
19 A. Yes, I see that. And I think this first relates
20 back to the AGP, which is the Australian government
21 review of this, which relates to environmental
22 issues, I believe.
23 Q. We're talking about your five parts per million
24 here; correct, sir?
25 A. The five micrograms per cigarette, which, if the
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
RECROSS-EXAMINATION - DAVID E. TOWNSEND

10697

1 tobacco rod weighed approximately a gram, would be
2 five parts per million, is the maximum residue in the
3 cigarette.
4 Q. Well let's see what --
5 A. And that's -- and that's -- and that's what Dr.
6 Rodgman makes clear in his report.
7 Q. And here's what B.A.T found. "Various analyses
8 undertaken in GR&DC (March 1982 and January 1983) on
9 cigarettes manufactured from various types of tobacco
10 have indicated that substantially higher values may
11 be found in practice. In one instance, the mean
12 values for different grades were 140" --
13 That would be about 28 times five; wouldn't it,
14 sir?
15 A. 140 would be about that.
16 Q. -- "100" --
17 That would be about 20 times the five; wouldn't
18 it?
19 A. Approximately, yes.
20 Q. -- "and 230" --
21 Which would be about 46 times the five parts per
22 million; correct?
23 A. Right.
24 Q. And that's "even after ignoring high 'outlies'."
25 Do you know what a high outlie is in a

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
RECROSS-EXAMINATION - DAVID E. TOWNSEND

10698

1 statistical analysis?
2 A. Sure.
3 Q. It means the high ones; correct?
4 A. It means there may be occasional points that are
5 higher or lower.
6 Q. And statistically there's not enough of them to
7 include those into a valid statistical analysis, so
8 you exclude them; correct?
9 A. If you do an appropriate statistical test that
10 concludes that you can throw those outliers away.
11 Q. And you have to do valid statistical tests to
12 draw valid scientific conclusions; don't you, sir?
13 A. Depends on what you're trying to do. To -- in
14 the case of the pH charts, for example, it's clear
15 that there's no upward trend looking at a number of
16 data that are averages of other data.

17 Q. I didn't ask you that.
18 A. If you make statistical assertions, then you
19 have to do the statistics.
20 Q. I didn't ask you that, sir.
21 A. Well you asked me about statistics. I was just
22 using an example.
23 MR. CIRESI: Let me ask you the question
24 again. Can you read it back, please, Mr. Stirewalt?
25 (Record read by the court reporter.)
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
RECROSS-EXAMINATION - DAVID E. TOWNSEND
10699

1 A. I think --
2 Q. A valid scientific conclusion, that's what I
3 asked.
4 A. I think there are scientific -- or statistical
5 tests that need to be run to assert statistical
6 certainty.
7 Q. Thank you.
8 Now "In another examination the range of mean
9 value varied from 41 to 131 (average 82);" correct?
10 A. That's what it says.
11 Q. And the Reynolds plant had indicated that its
12 control over residual Freon 11 was poor; isn't that
13 correct?
14 A. Now where do you see that?
15 Q. Why don't you turn to Exhibit 11449.
16 A. Okay.
17 Q. It's another BATCo document. Do you see that?
18 A. I see that.
19 Q. To Mr. T. G. Mitchell, Secretary of the Additive
20 Guidance Panel, from N. E. Willis?
21 A. I see that.
22 Q. Dated June 6, 1984; correct?
23 A. I see that.
24 MR. CIRESI: Your Honor, we would move
25 Exhibit 11449.

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
RECROSS-EXAMINATION - DAVID E. TOWNSEND
10700

1 MR. WEBER: No objection.
2 THE COURT: Court will receive 11449.
3 BY MR. CIRESI:
4 Q. Now sir, can you direct your attention to the
5 last sentence in the first paragraph there.
6 A. Okay.
7 Q. "Our recent experience with G13 expanded tobacco
8 ex. the Reynolds Plant, Trier" --
9 Do you know what that is?
10 A. Reynolds Tobacco Company has a cigarette
11 manufacturing plant in Trier, Germany. That's the
12 Trier, Germany plant.
13 Q. -- "indicated that the control over residual
14 Freon 11 was poor." Do you see that?
15 A. I see that. And that -- that plant in Trier for
16 G13 expansion was actually a very early prototype
17 pilot plant that was a batch process, not a
18 continuous process. That was a process that was
19 under poor control because it was a pilot plant; it
20 never -- it wasn't a commercial process. And the --
21 but the material that was made there at Trier was

22 shipped to B.A.T for their evaluation. The other --
23 Q. You don't know -- or we don't know, based upon
24 your own quality assurance records, what type of
25 control you had over Freon 11 here in the United

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
RE CROSS-EXAMINATION - DAVID E. TOWNSEND

10701

1 States; do we?

2 A. I think there's extensive quality control
3 records.

4 Q. We don't have those records here in court for
5 you to say what type of quality assurance there was;
6 do you?

7 A. We don't have those records in front of me here.
8 But as I've already testified, sampling of cigarettes
9 in the marketplace shows residual levels way below
10 five, and an average of 2.3 actually.

11 Q. And we also know that sampling of cigarettes in
12 the marketplace find 140, a hundred, 230 parts per
13 million; don't we?

14 A. No, we don't. That reference to that document
15 you were talking about, 140 parts per million, I read
16 as the analysis on the tobacco itself as received by
17 B.A.T from Trier, Germany.

18 Q. Is that the way you read that?

19 A. Yes.

20 Q. How do you get that out of that document?

21 A. Let's go back to the document which you referred
22 me to.

23 Q. Please do. It's Exhibit 11244.

24 A. All right.

25 Q. Page eight. It says "on cigarettes manufactured

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
RE CROSS-EXAMINATION - DAVID E. TOWNSEND

10702

1 from various types of tobacco;" doesn't it?

2 A. Well it does. My mistake.

3 Q. Thank you.

4 Now Mr. Weber asked you a question regarding
5 comparison of low tar cigarettes in the Surgeon
6 General's report and mentioned I didn't point
7 something out to you. Do you recall that?

8 A. Yes.

9 Q. Can you direct your attention to the Surgeon
10 General's report 1981, to page seven and eight.

11 A. Okay.

12 Q. Which is in the primary findings section, the
13 introduction; is it not?

14 A. This is the introduction.

15 Q. And I started you out at the bottom of that
16 paragraph -- or page seven; did I not?

17 A. Frankly, I can't remember at this point. I
18 think that's probably right, generally.

19 Q. "As discussed in this report..." remember that?

20 A. Okay.

21 Q. That's where I started you out; didn't I?
22 Carried you over on to the next page talking about
23 the differences in tobaccos and how they had changed
24 over time and how the fact was that they needed tests
25 to look at the new tobacco, didn't I point that out

STIREWALT & ASSOCIATES

10703

1 to you?
2 A. I recall something generally about this. To be
3 absolutely accurate about that's exactly where we
4 started out, I'd have to go back to a transcript, I
5 suppose.
6 Q. And I told --
7 I pointed out a number of other areas in this
8 1981 Surgeon General report that related to the old
9 tobacco versus the new tobacco and the need to do
10 studies on the new tobacco including additives;
11 didn't I?
12 A. I think you pointed out several references in
13 this report.
14 Q. Now with regard to compensation and ultralight
15 and light cigarettes, the FTC meeting that you
16 attended on December, I believe it was, 4th and 6th
17 of 1994, --
18 A. That's right.
19 Q. -- it reached some conclusions; didn't it, sir?
20 A. It reached a number of conclusions.
21 Q. And one of those was that brand names and brand
22 classifications such as light and ultralight
23 represent health claims and should be regulated and
24 accompanied in fair balance with an appropriate
25 disclaimer; correct?

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
RECROSS-EXAMINATION - DAVID E. TOWNSEND

10704

1 A. That sounds -- sounds generally correct as one
2 of the conclusions of the NCI panel.
3 Q. And the other conclusion that the NCI panel --
4 or the panel found, the FTC panel, was as follows:
5 "The available data suggest that smokers
6 misunderstand the FTC test data. This underscores
7 the need for an extensive public education effort."
8 Correct?
9 A. That generally, as I recall, is -- is generally
10 the -- one of the conclusions of the NCI FTC panel.
11 Q. And that was in 1994; correct, sir?
12 A. That's correct.
13 Q. And don't you think it's common sense, as you've
14 used that term so many times, that when a smoker sees
15 something that says there's a lot lower tar and
16 nicotine, that he or she thinks that's what they're
17 going to get, lower tar and nicotine?
18 A. No, I don't -- I don't think that's -- that a
19 smoker necessarily looks to those numbers to be
20 accurate. I think smokers recognize and realize that
21 how they puff on a cigarette will determine what they
22 get. I think consumers do use those numbers, the FTC
23 tar and nicotine numbers, for guidance in the
24 marketplace, they use the categories, be it full
25 flavor, full flavor low tar, ultra low tar or lowest,

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
RECROSS-EXAMINATION - DAVID E. TOWNSEND

10705

1 they use that for guidance in the marketplace, and
2 those categories are based on the FTC numbers.

3 Q. So you think that when a smoker buys a pack of
4 cigarettes that says it's lower tar and lower
5 nicotine, they don't think they're getting lower tar
6 or lower nicotine?
7 A. No, I don't think that's what I said at all. I
8 think when a smoker -- when a smoker chooses an ultra
9 low tar product over a full flavor, I think they --
10 they believe that they're getting lower tar, and as a
11 group they are.
12 Q. You -- you keep saying "ultra low tar."
13 A. Uh-huh.
14 Q. I didn't ask about ultra low tar.
15 A. Okay.
16 Q. I said low tar.
17 A. Okay.
18 Q. Is your answer the same for low tar?
19 A. The differences between full flavor and low tar
20 are less, but I think as a -- as a group, low tar
21 smokers tend to get less on the average.
22 Q. And do you think it's common sense that they
23 think when they are getting that cigarette, they're
24 getting a safer cigarette?
25 A. I'm not an expert in the area of people's

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
RE CROSS-EXAMINATION - DAVID E. TOWNSEND

10706

1 awareness. I've concluded from reading a variety of
2 things that people believe that low tar and ultra low
3 tar cigarettes might be safer. They've certainly
4 heard that from the Surgeon General. They've
5 certainly heard that from the Public Health Service.
6 And they've heard it from advertisements on
7 television and the newspaper. I can recall when I
8 was much younger seeing a television advertisement
9 where a commentator would put the cigarette out
10 halfway and say, "If you're going to smoke, smoke
11 only half of it" because less is better. That last
12 phrase actually is something -- that's my
13 interpretation of it. But --

14 Q. Has your --

15 A. -- that was the same concept. And I remember
16 that television commercial very clearly. So I think
17 smokers have heard that a number of times and they
18 believe that.

19 Is it true? Are low tar and ultra low tar
20 cigarettes safer? Well there's no way to prove it.
21 Do we think they are? To me, common sense is less is
22 better.

23 Q. Yes. But the epidemiological data known today
24 says they are not, and we saw that in the Morbidity
25 and Mortality Weekly Report; didn't we, sir?

STIREWALT & ASSOCIATES

P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
RE CROSS-EXAMINATION - DAVID E. TOWNSEND

10707

1 A. You can see references that conclude different
2 things from the epidemiology. There's clear
3 evidence, and I think most epidemiologists will
4 agree, that there's been a significant risk reduction
5 in lung cancer comparing filtered cigarettes to the
6 higher tar unfiltered cigarettes.

7 Q. That wasn't my question.

8 A. That tells me --
9 Q. Sir, that wasn't my question. Did you not
10 understand the question again?
11 A. Please ask it again.
12 MR. CIRESI: We'll ask it again. Mr.
13 Stirewalt, could you ask the question again.
14 (Record read by the court reporter.)
15 Q. Did we see that in the Morbidity and Mortality
16 Weekly Report?
17 A. For lung cancer?
18 Q. Yes.
19 A. I can't recall. We can look at it again. I'm
20 sorry.
21 Q. Reynolds has never told the consuming public
22 that low tar/low nicotine cigarettes are not safer;
23 has it?
24 A. I'm not aware of such a case, sir.
25 Q. Reynolds has known that for decades; hasn't it?

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
RE CROSS-EXAMINATION - DAVID E. TOWNSEND

10708

1 A. No, I don't agree with that at all. I don't
2 think Reynolds has known that low tar cigarettes are
3 not safer than high tar cigarettes. I think there's
4 no way to prove it, to prove whether they are safer
5 or not.
6 Q. Reynolds has known for decades that it can't say
7 whether they're safer or not; correct?
8 A. There's no way to prove whether a cigarette is
9 safer than another. There's no agreed-on measure of
10 progress that includes a battery of biological tests
11 and a battery of chemical tests that scientists agree
12 shows that one cigarette is safer than another, so
13 there's no way to say that.
14 Q. Reynolds has never told the public since 1966
15 when it put out a low tar cigarette that it doesn't
16 know if it was safer or not; has it?
17 A. I'm not aware of a case where R. J. Reynolds has
18 told the smoking public that a particular cigarette
19 is safer than another or not safer than another.
20 Q. With regard to the Massachusetts study that you
21 referred to, you do not know the type of testing that
22 was done in that study; do you?
23 A. I disagree with you.
24 Q. How do you know what type of testing was done
25 for pH?

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
RE CROSS-EXAMINATION - DAVID E. TOWNSEND

10709

1 A. I'm sorry?
2 Q. For pH.
3 A. How do I know what type of testing --
4 Q. Yes.
5 A. -- was done for pH?
6 Q. What type of testing methodology was used for
7 each test?
8 A. Each company, because the Commonwealth of
9 Massachusetts didn't have clear, specific guidelines
10 for every aspect of the test, companies unfortunately
11 had to use somewhat different methods. R. J.
12 Reynolds used a water bubbler method like I

13 described.
14 Q. I didn't ask about R. J. Reynolds, I asked about
15 all of the tests in that study.
16 A. Well you --
17 Q. It wasn't just R. J. Reynolds; was it?
18 A. Oh, you're talking about Dr. Rickert's study.
19 Q. In the Massachusetts document that you just
20 talked about.
21 A. Excuse me, I was confused.
22 Q. Yeah.
23 A. I thought you were talking about the pH data
24 that we actually provided to the Commonwealth of
25 Massachusetts --

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
RE CROSS-EXAMINATION - DAVID E. TOWNSEND

10710

1 Q. No, I'm talking about --
2 A. -- for all -- for all of our brands.
3 Q. I'm talking about the Massachusetts document
4 that Mr. Weber just asked you about no more than 10,
5 15 minutes ago.
6 A. I don't recall the specific method that Dr.
7 Rickert used. I know that some of our scientists had
8 discussed various types of methods with Dr. Rickert.
9 And actually we've done some collaborative studies, I
10 believe, with Dr. Rickert.
11 Q. You have no idea what type of studies or test
12 methods were used in that particular work; do you,
13 sir?
14 A. I don't recall what test method Dr. Rickert uses
15 or used in that specific study for the Commonwealth
16 of Massachusetts.
17 Q. And you do not know what percentage of free
18 nicotine was in the vapor phase in any of those tests
19 for any of those cigarettes; do you, sir?
20 A. In -- in the way that -- that water traps are
21 used, I think that collects nicotine from the vapor
22 phase and from the particulate phase.
23 Q. That's not what I asked.
24 You don't know what free nicotine was in the
25 vapor phase in any of the tests in that study because

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953
RE CROSS-EXAMINATION - DAVID E. TOWNSEND

10711

1 you don't know what the tests were; do you?
2 A. I don't know a way of determining or estimating
3 the free nicotine in those tests, as you ask the
4 question.
5 Q. Right. And you yourself have never done such a
6 study; have you?
7 A. No, I haven't.
8 Q. You do not have the expertise to do such a
9 study; do you?
10 A. What do you mean?
11 Q. The ability to conduct such a test. Have you
12 ever tried it, you yourself?
13 A. Me personally?
14 Q. Yes.
15 A. No.
16 MR. CIRESI: Thank you. I have no further
17 questions.

18 THE COURT: Do you have any questions,
19 counsel?
20 MR. WEBER: Nothing further, Your Honor.
21 THE COURT: All right. You may step down.
22 We will recess, reconvene tomorrow morning at 9:30.
23 THE CLERK: Court stands in recess to
24 reconvene tomorrow morning at 9:30.
25 (Recess taken.)

STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55408 1-800-553-1953